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*Bruchia bolanderi* **Lesquereux (Bruchiaceae), a species and family new for the Utah bryoflora**
James R. Shevock & Nancy G. Slack 1 -b

*Cercidospora soror* **and** *Rhizocarpon malenconianum* **from North America**
Bruce McCune & Jeanne Ponzetti 6 -g

**Underlying Specimens for the Systematic Treatment of the Ephemeraceae in the Bryophyte Flora of North America**
Virginia S. Bryan 13 -b

**Lichen flora of the eastern Mojave Desert: Blackrock Arizona, Mojave County, Arizona, USA**
Heather Bird Jackson, Steven Leavitt, Thomas Krebs, Larry L. St. Clair 30 -l

**NPLichen: A Database of Lichens in the U. S. National Parks**
James P. Bennett & Clifford M. Wetmore 39 -l

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# *Bruchia bolanderi* Lesquereux (Bruchiaceae), a species and family new for the Utah bryoflora

James R. Shevock[1] & Nancy G. Slack[2]

**Abstract** -- The ephemeral moss, *Bruchia bolanderi* is reported new to Utah. Its diminutive size coupled with sporophytes only appearing in late summer to early fall may account for it being overlooked by previous field bryologists.

During the ABLS meetings held at Snowbird, Utah from July 31-August 5, 2004, a day field trip was taken to the Uinta Mountains. At the last stop of the day, at over 10,000 feet at Mirror Lake, a small specimen of *Bruchia* with elongate setae was obtained in a species-rich seep or flush by Slack. Also present in this habitat were such species as *Bryum pallens* Swartz, *B. pseudotriquetrum* (Hedwig) Gärtner, Meyer & Scherbius, *B. weigelii* Sprengel, *Hygrohypnum smithii* (Swartz *in* Liljeblad) Brotherus, *Leiocolea heterocolpos* (Thed. *ex* C. Hartm.) H. Buch, *Lophozia lycopodioides* (Wallr.) Cogn., *L.*

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*ventricosa* (Dicks.) Dumortier, *Oncophorus virens* (Hedwig) Bridel and *Rhizomnium pseudopunctatum* (Bruch & Schimper) T. Koponen. Bill Buck also collected a small sample of *Bruchia* at this location, but on damp compacted granitic soil adjacent to the campground parking lot.

On the return bus ride to Snowbird, Slack listed the species she had collected, including *Bruchia* to Shevock who immediately recognized *Bruchia* as new for Utah since no species of Bruchiaceae had previously been reported for this state (Flowers 1973; Rushing 1986). What remained, however, was to determine which species of *Bruchia* these plants represented. It was suspected that the Utah plants could be *Bruchia bolanderi* Lesquereux, a species of similar appearing sub-alpine to montane meadow-like habitats primarily of the Sierra Nevada of California and extending northward into the Cascade Ranges of southern Oregon (Rushing 1986; Norris & Shevock 2004 a, b). While the Utah plants had only immature capsules at the time of collection, the basic habitat and gestalt of the plants resembled *Bruchia bolanderi*, a plant that the first author has collected several times from California.

Samples of the Utah plants were eventually studied under the microscope that supported the tentative field identification. Besides being the easternmost occurrence for this species, it also extends the elevation range nearly 1,000 feet higher than any of the documented California or Oregon occurrences.

USA, Utah, Duchesne County: Wasatch-Cache National Forest. Mirror Lake Campground off of Highway 150, T4N, R9W, section 34, Lat/Long: 40°42'03" N; 110°53'12" W. Elev: 10,035 ft., 1 August 2004, *Shevock 26063* (CAS), *Slack 2004-99* (MO) and *Buck 47283* (NY).

*Habitat*: *Bruchia bolanderi* at the Utah site occurs in a fen-like seep or flush along a small rivulet and on damp granitic sandy and loamy soils adjacent to the campground parking lot in an open lodgepole pine (*Pinus contorta*) forest.

*Significance*: This collection of *Bruchia bolanderi* extends the range of this species eastward by more than 600 miles from the Sierra Nevada of California to the Uinta Mountains within the Middle Rocky Mountain Province. The likelihood of locating additional occurrences of *Bruchia bolanderi* in Utah and in the

Intermountain West is now highly probable, especially if searches for this species are conducted in late summer through early fall when mature sporophytes are likely to be present. In a gametophytic state, *Bruchia bolanderi* is rarely collected or recognized. The small size of *Bruchia* is perhaps the main reason why it was not collected previously, even though Flowers (1973) made many collections from the Uinta Mountains.

**Acknowledgment --** We thank Dr. Jeff Duckett for providing several of the liverwort determinations for the associated species list. Wayne Padgett, forest ecologist with the Wasatch-Cache National Forest, kindly provided the range, township and section for this collection site. Thanks also to Clayton Newberry. As ABLS trip leader, he selected the three collecting sites that could accommodate a large bus and the last site visited yielded this species new for Utah. Having a large cadre of bryologists and lichenologists "exploring" an area also increases the potential to find novelties. All of the collectors on the ABLS field trip contributed at some level to this effort and excitement of documenting a new state record.

## References

Flowers, S. 1973. Mosses: Utah and the West. Brigham Young University Press, Provo, UT.

Norris, D.H. and J.R. Shevock. 2004a. Contributions toward a bryoflora of California I: a specimen-based catalogue of mosses. Madroño 51: 1-131.

_____. 2004b. Contributions toward a bryoflora of California II. a key to the mosses. Madroño 51: 133-269.

Rushing, A. 1986. A revision of the genus *Bruchia* Schwaegr. (Musci). J. Hattori Bot. Lab. 60: 35-83.

# *Cercidospora soror* and *Rhizocarpon malenconianum* from North America

Bruce McCune[1] & Jeanne Ponzetti[2]

## *Cercidospora soror* Obermayer & Triebel

Recent studies on the lichen genus *Arthrorhaphis* and its fungal parasites have greatly improved our understanding of these groups (Hafellner & Obermayer 1995; Hansen & Obermayer 1999; Ihlen 1997a, 1997b; Obermayer 1994, 1996; Santesson & Tønsberg 1994). *Cercidospora* Körber, a genus of lichenicolous fungi in the Dothidiales, contains parasites specializing in *Arthrorhaphis* and various other genera (Navarro-Rosinés et al. 2004). One species parasitic on *Arthrorhaphis* has been reported for western North America, *C. trypetheliza* (Nyl.) Hafellner & Obermayer, as *Neonorrlinia trypetheliza* (Nyl.) Sydow (Weber & Wittmann 1992; same

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listing in the latest available online version of the catalog of the Colorado flora).

Previously known from Greenland, Asia, Europe, and South America (Hafellner & Obermayer 1995, Hansen & Obermayer 1999, Ihlen 1997b), *Cercidospora soror* was recently found in western Oregon. The collection was on a sparsely fertile population of *Arthrorhaphis citrinella* (Ach.) Poelt, growing on the side of a large talus boulder. This pocket of talus, with many boulders 1-3 m in diameter, is surrounded by old forest. The area appears to have been little disturbed in recent centuries. Perhaps this is one factor leading to the occurrence of this and other rare or infrequent species in the Coast Range, including *Pyrenopsis furfurea* (Nyl.) Leighton, *Stereocaulon condensatum* Hoffm., *Umbilicaria angulata* Tuck., and *U. havaasii* Llano.

*Cercidospora* forms black perithecia, in section with a greenish black upper part, and containing 4-celled hyaline spores that are typically broader at one end than the other. See Hafellner & Obermayer (1995) for more details.

Specimen examined.– USA: Oregon, Benton Co., Coast Range, talus slope on south side of Marys Peak, light-colored volcanic rock, surrounded by old *Pseudotsuga* forest, 44° 30.004'N 123° 33.106'W, 970 m, Sept. 2003, *McCune 27071b* (OSC).

***Rhizocarpon malenconianum*** (Llimona & Werner) Hafellner & Mayrhofer

*Leciographa malenconiana* Llimona and Werner was described as a lichenicolous lichenized fungus specializing on *Diploschistes steppicus* Reichert, now known as *D. diacapsis* (Ach.) Lumbsch. Initially it was reported from a number of sites in Spain (Llimona & Werner 1975), followed by North Africa (Casares-Porcel et al. 1994) as *Rhizocarpon malenconianum.*

This distinctive lichen can be readily recognized with a hand lens. The thallus forms small yellow mounds of areoles on *Diploschistes*, the areoles clustered around one to several jet black apothecia. The thallus color ranges from a very pale yellowish tan to an intense yellow, similar to *R. geographicum* (L.) DC. The general impression is of small thalli of *Epilichen* *scabrosus* (Ach.) Clem., but growing on *Diploschistes* rather than *Baeomyces*. We found it only on *D. muscorum*.

Microscopically, the ascospores are distinctive: mostly 3-septate (occasionally more or less), and the spore septation and outline are often slightly asymmetrical or irregular. See Llimona and Werner (1975) for a full description and line drawings.

So far this species is known in North America from the steppe of south-central Washington. Most records are from a cluster of sites in an area about 8 km wide, the portion of Horse Heaven Hills managed by the Bureau of Land Management. This is a hilly escarpment of the Columbia Plateau, facing north toward the Yakima River near Benton City. The low elevations make this a relatively warm site, compared to the rest of the Columbia Basin. The ridgetop has very thin soils, is quite rocky, and is dominated by sparse cushion plants, lichens, and bryophytes. The slopes are steep to gentle, with some benches. The slopes and benches are dominated by bunchgrasses (especially *Pseudoroegneria spicata*) and, in areas without recent fire, *Artemisia tridentata*.

*Diploschistes muscorum* is a common component of the biotic crust on the soil. It seems to be particularly common in areas without recent disturbance. *Diploschistes diacapsis*, the substrate for *R. malenconianum* in Spain, is not known from the study area.

*Rhizocarpon malenconianum* in Europe and North Africa is known from gypsiferous soils. While gypsiferous soils are not known from Horse Heaven Hills, some areas are weakly to moderately calcareous, due to exposure of caliche.

Another parasite frequently accompanied *Rhizocarpon malenconianum*. This parasite forms clusters of dark gray warts on *Diploschistes*, but no reproductive structures have been found.

Specimens examined.– USA: Washington: Benton Co., Horse Heaven Hills, 46° 14.63'N 119° 35.79'W, 390 m, Nov. 1998, *Ponzetti 1285a* (also *Ponzetti 955a, 1149a, 1189, 1245,* and *McCune 24291* from this vicinity, at 390-540 m elevation; specimens in OSC and the research herbaria of the authors); Yakima Co., 46° 31.57'N, 120° 24.74'W, 425 m, *Ponzetti 1582* (OSC).

## References

Casares-Porcel, M., M. R. Gonzalez-Tejero & A. Bouchaalah. 1994. Contribución al conocimiento del la flora liquénica gipsícola de Marruecos. Cryptogamie, Bryologie- & Lichénologie 15: 239-244.

Hafellner, J. & W. Obermayer. 1995. *Cercidospora trypetheliza* und einege weitere lichenicole Ascomyceten auf *Arthrorhaphis*. Cryptogamie, Bryologie Lichenólogie 16: 177-190.

Hansen, E. S. and W. Obermayer. 1999. Notes on *Arthrorhaphis* and its lichenicolous fungi in Greenland. Bryologist 102: 104-107.

Ihlen, P. G. 1997a. *Arthrorhaphis vacillans* ny for Svalbard. Graphis scripta 8: 31.

Ihlen, P. G. 1997b. Contributions to the Norwegian flora of lichens and lichenicolous fungi. *Graphis Scripta* 8: 33-39.

Llimona, X. & R. G. Werner. 1975. *Leciographa malenconiana*, Llimona et R. G. Werner (Lecideaceae, Lecanorales), ascomycete lichenicole nouveau, des sols gypseux de l'Espagne. Bulletin de la Société Mycologique de France 91:3 97-402.

Navarro-Rosinés, P., V. Calatayud, & J. Hafellner. 2004. *Cercidospora*. pp. 635-639 in Nash, T. H., III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz. 2004. Lichen Flora of the Greater Sonoran Desert Region. Vol. II. Lichens Unlimited, Tempe, Arizona.

Obermayer, W. 1994. Die Flechtengattung *Arthrorhaphis* (Arthrorhaphidaceae, Ascomycotina) in Europa und Grönland. Nova Hedwigia 58: 275-333.

Obermayer, W. 1996. The genus *Arthrorhaphis* in the Himalayas, the Karakorum and the subalpine and alpine region of southeastern Tibet. Journal of the Hattori Botanical Laboratory 80:331-342. Nova Hedwigia 58: 275-333.

Santesson, R. & T. Tønsberg. 1994. *Arthrorhaphis aeruginosa* and *A. olivaceae*, two new lichenicolous fungi. Lichenologist 26: 295-299.

Weber, W. A. and R. C. Wittmann. 1992. *Catalog of the Colorado Flora: a Biodiversity Baseline.* University of Colorado Press, Boulder.

# Specimens Underlying the Systematic Treatment of the Ephemeraceae in the Bryophyte Flora of North America

Virginia S. Bryan[1]

**Abstract** -- This study identifies specimens of the Ephemeraceae I considered in deriving the systematic treatment presented in the Bryophyte Flora of North America. It provides data that are not cited in the Flora: the municipal regions or counties where the specimens were collected and also the herbaria from which these specimens were borrowed. The Systematic Treatment of the Ephemeraceae is now, and has been for some time, on the Web (http://ridgwaydb.mobot.org/bfna/v1/epheephemeraceae), awaiting publication of the appropriate volume. The contents of this paper augment the treatment by including data that, because of space constraints, cannot be included in the Flora. They provide additional data which suggest ecological relationships. They would certainly be useful to researchers interested in the distribution of family members by county. Furthermore, the counties reveal the section of each state in which a given taxon could be found. For example, a collector interested in *Micromitrium* would see that it has been widely collected in Florida and would learn from the list of counties that all species, except *M. wrightii*, have been found in northern and central Florida, but not in the southern part of the peninsula. Apparently confined to more tropical regions, *M. wrightii* has been collected in

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North America only in the coastal counties of Louisiana and Texas. These distributions suggest that *M. wrightii* may also occur in southern Florida. Similar data illuminate possible distribution patterns for other taxa, details that may not be evident in the BFNA treatment.

## Specimens Underlying the Systematic Treatment of the Ephemeraceae in the Bryophyte Flora of North America

| **Taxon** | **Province or State** | **Municipal Regions or Counties** | **Herbaria** |
|---|---|---|---|
| | | | |
| *Micromitrium synoicum* | Fla. | Polk, Seminole | DUKE, F, MO, NY |
| - | Iowa | Poweshiek, Winneshiek | CANM, CAS, COLO, DUKE, F, ISC, LAF, MICH, MO, MT, NBM, NY, TRTC, UBC, US, WTU |
| - | Ky. | Jefferson, Rowan | CANM, UBC, A. C. Risk, |
| - | Mo. | Saline | FH, NY |
| - | N.C. | Bladen, Durham, Transylvania | DUKE, MO |
| - | N.J. | Bergen, Camden, Essex, Gloucester | BM, CANM, CAS, COLO, |

| | | | |
|---|---|---|---|
| | | | DUKE, F, FH, MICH, MO, NBM, NY, UBC, US |
| _ | N.Y. | Richmond | NY |
| _ | Ohio | Pike, Franklin | F, US |
| _ | Ore. | Lynn | DUKE |
| _ | Pa. | Lehigh, Northampton, Philadelphia | F, NY, US |
| _ | | | |
| *Micromitrium tenerum* | B.C. | Vancouver | CANM, DUKE, MICH, NBM, NY, UBC, WTU |
| | N.S. | Hants | ACAD, NBM, NY |
| _ | Que. | Oka, Montreal | CANM, QFA |
| _ | Conn. | New Haven, Tolland | CANM, COLO, F, MICH, MO, NBM, NY, QFA, UBC, US, WTU |
| _ | Fla. | Duval, Hillsborough, Leon, Madison, Polk, Seminole | ACAD, CANM, CAS, COLO, DUKE, ISU, LAF, MICH, MO, MT, NBM, NY, QFA, UBC, TRTC, WTU, US |

| | | | |
|---|---|---|---|
| _ | Ga. | Jeff Davis | DUKE, NY |
| _ | Ill. | Jersey | MO |
| _ | Iowa | Poweshiek | NY |
| _ | | | |
| _ | Ky. | Bath, Montgomery, Rowan | DUKE, TENN, A. C. Risk |
| _ | La. | Catahoula, Evangeline, Livingston | COLO, DUKE, LAF, MICH, MO |
| _ | Maine | Penobscot, York | MCTC |
| _ | Md. | Baltimore | US |
| _ | Mich. | Allegan | DUKE, MICH |
| _ | Mo. | St. Genevieve | NY |
| _ | N.C. | Durham, Columbus, Forsyth, Mecklenberg, Transylvania, Wake, Wayne | ALTA, DUKE, ISC, MO, MT, NY, WTU |
| _ | N.J. | Bergen, Burlington, Closter, Essex, Hunterdon, Monmouth, Ocean | CAS, DUKE, F, ISC, MICH, MO, NBM, NY, WTU |
| _ | N.Y. | Cattaraugus, Erie, Richmond, Rockland, Westchester | CANM, DUKE, FH, ISC, MCTC, MICH, MO, NFLD, NY, TRTC, WTC |
| _ | Ohio | Cuyahoga, Jackson, Pickaway, Pike | DUKE, ISC, MO, US |
| _ | Pa. | Bucks, Philadelphia | MO, NY |
| _ | S.C. | Aiken | DUKE |

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|---|---|---|---|
| _ | Tenn. | Campbell | A. Risk |
| _ | Va. | Giles | NY |
| _ | W. Va. | Barbour, Pocahontas | ISC, MO, NY, WTU US |
| _ | | | |
| *Micromitrium megalosporum* | Conn. | New Haven | DUKE, MICH, NY |
| _ | Fla. | Highlands, Leon, Liberty, Manatee, Polk, Seminole, Wakulla | CANM, CAS, COLO, DUKE, F, ISC, LAF, MICH, MO, MT, NBM, NY, QFA, UBC, WTU, US |
| | Ga. | Bibb, Jeff Davis, Sumter | NY, US |
| _ | La. | Catahoula, Evangeline, Iberia, Lafayette | CANM, COLO, DUKE, LAF, MICH, MO, NY, US |
| _ | Maine | York | NY |
| _ | | | |
| _ | Md. | Baltimore, Prince Georges | CANM, DUKE, LAF, MICH, NY, US |
| _ | Mich. | Allegan | MICH |
| _ | Miss. | Panola, Scott | DUKE, NY |
| _ | Mo. | Reynolds | DUKE, NY |
| _ | N.C. | Bladen, Columbus, Durham, | DUKE, MO, TRTC, |

| | | | |
|---|---|---|---|
| | | Mecklenberg, Scotland, Transylvania, Union, Wilson | WTU, Alan Risk |
| _ | N.J. | Bergen, Camden, Ocean | CAS, DUKE, F, MICH, MO, NY, US |
| _ | Pa. | Philadelphia | NY |
| _ | Wis. | Jackson | Frank Bowers |
| _ | | | |
| *Micromitrium wrightii* | La. | Lafayette, Natchitoches | LAF, MICH, US |
| _ | Tex. | Newton | LAF |
| | | | |
| *Ephemerum serratum* | N.S. | Annapolis, Digby, Hants, Inverness, Kings, Windsor | ACAD, CANM, DUKE, NBM, TRTC |
| _ | Ont. | Durham, Peel, Ottawa | CANM, MO, TRTC |
| _ | Que. | Hull | CANM, US |
| _ | Sask. | Carleton | CANM, MICH, NY |
| _ | Ala. | Chambers | DUKE |
| _ | Calif. | Lake, Mendocino, San Mateo, Santa Clara, Santa Cruz, Shasta, Sonoma | ALTA, CANM, COLO, CAS, DUKE, F, NY, UBC |
| _ | Conn. | Hartford, New Haven | F, NY |
| _ | Fla. | Leon, Manatee, Polk, Seminole | F, MO, NY |
| _ | Ind. | Putnam | NY |

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|---|---|---|---|
| _ | Ky. | Bath | A. C. Risk |
| _ | La. | Catahoula | DUKE, F |
| _ | Maine | York | F, WTU |
| _ | Md. | Montgomery | DUKE |
| _ | Mass. | Middlesex | MICH, NY, US |
| _ | Miss. | Panola | DUKE |
| _ | Mo. | Scott | MO |
| _ | N.C. | Durham, Mecklenberg | DUKE |
| _ | N.H. | Coos | F, OSC |
| _ | N.J. | Bergen, Camden | CANM, DUKE, F, MICH, MO, NY, UBC |
| _ | N.Y. | Richmond, Westchester | MICH, MO, NY |
| _ | Ohio | Hocking, Pickaway, Ross | MO |
| _ | Oreg. | Benton, Lane | OSC |
| _ | Pa. | Bucks, Centre, Erie, Monroe, Philadelphia | F, MO |
| _ | S.C. | Charleston | MO |
| _ | Tenn. | Knox | ISC |
| _ | Tex. | Bastrop, Hildago, Nuecas | BRIT, DUKE, NY |
| _ | Va. | Giles, Greensville | NY |
| _ | W. Va. | Pocohontas | NY |
| _ | Wis. | Crawford | CANM |
| _ | | | |
| *Ephemerum cohaerens* | Ont. | Brant, Bruce, Durham, Elgin, Northumberland, Ontario, Simcoe, York | CANM, DUKE, ISC, MICH, MO, TRTC, UBC, WTU |
| _ | Que. | Montreal | MICH, MT |

| | | | |
|---|---|---|---|
| _ | Ala. | Conecuh, Houston | CANM, DUKE |
| _ | Ark. | Sharp | NY |
| _ | Conn. | Litchfield | NY |
| _ | Del. | Kent | US |
| _ | Fla. | Collier, Holmes, Jackson, Levy, Liberty, Nassau, Seminole | DUKE, MICH, MO, NY |
| _ | | | |
| _ | Ga. | Charlton | DUKE |
| _ | Ill. | Cook, Jersey | F, MICH, MO |
| _ | Iowa | Blackhawk, Hardin, Polk, Poweshiek, Storey, Tama | ISC, MICH, MO, WTU |
| _ | Kan. | Miami, Pottawatomie, Reno, Republic, Riley, Stafford, Sumner, Wabaunsee | ALTA, CANM, DUKE, MO, NY, US, WTU |
| _ | Ky. | Estill, Menafee, Rowan | DUKE, A. C. Risk, TENN |
| _ | La. | Acadia, Allen, La Salle, Ouachita, Plaquemines, St. Charles, Vermilion, Winn | CANM, COLO, DUKE, LAF, MO, NY |
| _ | Md. | Montgomery | MICH |
| _ | Mich. | Alpena, Bay, Gratiot, Kalamazoo, Livingston, Montmorency, Saginaw, Washtenaw, Wayne | ALTA, CANM, COLO, DUKE, F, MICH, MO, NFLD, NY, TRTC, US |

| | | | |
|---|---|---|---|
| _ | Minn. | Winona | COLO, MO, NY, WTU |
| _ | Mo. | Crawford, Jackson, Shannon, Taney | DUKE, MO, UBC, US |
| _ | N.C. | Durham | DUKE |
| _ | Nebr. | Douglas | MICH |
| _ | N.H. | [Whale Park?] | MICH, NY |
| _ | N.Y. | Cayuga, Tompkins | NY |
| _ | Ohio | Hamilton, Lancastor, Pickaway, Ross | CANM, DUKE, F, MO, NY, |
| _ | | | |
| _ | Okla. | Stephens | BRIT |
| _ | Pa. | Lancaster, Lehigh, Northampton, Luzerne, Philadelphia | F, NY |
| _ | Tenn. | Knox, Montgomery | MICH, MO, NY, TENN, TRTC, WTU, A. C. Risk |
| _ | Tex. | Bastrop, Bexar, Burleson, Cameron, Cooke, Dallas, Gillespie, Hildago, Jim Hogg, Kleberg, Live Oak, McLennon, Nueces, Travis, Wichita; Hays reported by E. Whitehouse | BRIT, DUKE, ISC, LAF, MICH, MO, NY |
| _ | Va. | unknown | MICH, MO |
| _ | W.Va. | Barbour, Kanawha, Marion, Summers | MICH, MO, NY, US, WTU |
| | | | |

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|---|---|---|---|
| *Ephemerum crassinervium* var. *crassinervium* | Ont. | Brant, Bruce, Dundas, Durham, Elgin, Halton, Hastings, Lennox & Addington, Middlesex, Northumberland, Ottawa-Carleton, York | CANM, COLO, DUKE, ISC, LAF, MICH, MO, NY, QFA, TRTC, UBC, US, WTU |
| _ | Que. | Rouville, Shefford | DUKE, ISC, MICH, MT, QFA, WTU |
| _ | Sask. | Carleton | CANM, MICH |
| _ | Conn. | New Haven | MICH, NY, UBC |
| _ | Del. | Sussex | US |
| _ | D.C. | District of Columbia | US |
| _ | Fla. | Gadsen, Jackson, Liberty, Manatee, Polk, Seminole, Volusia, Wakulla | CANM, CAS, COLO, DUKE, F, ISC, MICH, MO, MT, NBM, NY. US, WTU |
| _ | Ga. | Coffee | DUKE, NY |
| _ | Ill. | Coles, De Kalb, Fulton, Jersey, Menard | CANM, DUKE, ISC, MO, NY |
| _ | Ind. | Putnam | MO, NY |
| _ | Iowa | Appanoose, Blackhawk, Jasper, Polk, Poweshiek, Tama | CANM, COLO, DUKE, F, ISC, MICH, MO, NY |
| _ | Kans. | Reno | DUKE, NY |

| | | | |
|---|---|---|---|
| – | Ky. | Estill, Letcher, Menifee | DUKE, TENN |
| – | La. | Acadia, Lafayette, West Feliciana | DUKE, LAF |
| – | Md. | Baltimore | DUKE |
| – | Mich. | Emmet, Gratiot, Ingham, Jackson, Monroe, Presque Isle, Saginaw, St. Clair, Washtenaw, Wayne | ALTA, DUKE, LAF, MICH, NY, UBC |
| – | Minn. | Winona | COLO, MO, NY, QFA, WTU |
| – | Miss. | Itawamba, Jackson, Jefferson; Jasper, Scott reported by W. B. Buck | MICH, NY |
| – | Mo. | Atchinson, Crawford, Iron, Jackson, Jefferson, St. Charles, Saint Louis city, Saline, Washington | ALTA, DUKE, MO, NY |
| – | Nebr. | Lancaster | CANM, COLO, DUKE, F, ISC, MICH, MO, MT, NBM, NY, US |
| – | N.C. | Durham, McDowell, Mecklenberg, New Hanover, Orange, Sampson | DUKE, MICH, MO, NY, TRTC, US |
| – | N.H. | Coos | F, OSC |
| – | N.J. | Bergen, Camden, Somerset | CANM, COLO, |

| | | | |
|---|---|---|---|
| | | | CAS, DUKE, F, MICH, MO, NY, UBC, US |
| - | N.Y. | Bronx, Cattaragus, Erie, Putnam, Rensselaer, Richmond, Rockland, Saratoga, Westchester | CANM, DUKE, MICH, MO, NY, US |
| - | Ohio | Franklin, Hocking, Pickaway, Ross | DUKE, F, MICH, MO, MT, NY, US, WTC |
| - | Oreg. | Lane | MICH, OSC, UBC |
| - | Pa. | Centre, Huntingdon, McKean, Northampton, Philadelphia | F, MO, NY |
| - | S.C. | Unknown | NY |
| - | Tenn. | Anderson, Fentress, Grainger, Knox | CANM, DUKE, F, MICH, MO, NY, TENN, TRTC, WTU, A. C . Risk |
| - | Tex. | Bastrop, Harris, La Salle, San Patricio, Travis; Cameron & Hildago reported by E. Whitehouse | CANM, COLO, LAF, MICH, MO |
| - | Va. | Botetourt, Frederick, Giles, Loudoun, Prince Edward, Roanoke | NY, US |

| | | | |
|---|---|---|---|
| - | W.Va. | Barbour, Kanawha, Marion, Pocahantas, Summers | CANM, DUKE, F, ISC, MICH, MO, NY, US, WTU |
| - | Wis. | Grant | MT |
| - | | | |
| *Ephemerum crassinervium* var. *texanum* | Ont. | Bruce, Durham,York | CANM, DUKE, TRTC, UBC |
| - | Ala. | Conecuh, Houston | CANM, DUKE, NY |
| - | Ark. | Conway, reported by R. R. Ireland | MO |
| - | Fla. | Jackson, Leon, Liberty, Marion, Okaloosa, Seminole, Volusia | CANM, DUKE, MICH, NY |
| - | Ga. | Charlton, Laurens | DUKE, NY |
| - | Ill. | Johnson | NY |
| - | Ind. | Putnam | NY |
| - | Iowa | Jasper, Poweshiek | ISC, NY, US |
| - | Kan. | Marion | DUKE |
| - | Ky. | Bath | DUKE, A. C. Risk |
| - | La. | Acadia, Allen, Iberia, La Salle, Washington, West Feliciana | F, LAF |
| - | Minn. | Winona | F, US |
| - | Miss. | Panola | DUKE |
| - | Mo. | Jefferson, reported by P. L. Redfearn | MO |
| - | N.J. | Bergen | DUKE, MICH, MO, NY |

| | | | |
|---|---|---|---|
| _ | N.Y. | Rockland | MICH |
| _ | N.C. | Durham, Mecklenberg, New Hanover | DUKE |
| _ | Ohio | Franklin | MICH, MO, MT, NY |
| _ | Okla. | Payne | MO |
| _ | Pa. | Berks, Lehigh, Northampton | NY |
| _ | S.C. | Berkeley, Clarendon | NY |
| _ | Tenn. | Fentress | F, MO, NBM, NY, QFA, TRTC |
| _ | Tex. | Bastrop, Harris, La Salle, San Patricio; Travis reported by E. Whitehouse, Walker | BRIT, DUKE, F, ISC, MICH, NY, UBC, US |
| _ | W.Va. | Barbour, Pocahontas | DUKE, MO |
| _ | | | |
| *Ephemerum spinulosum* | Ont. | Brant, Durham, Halton, Kent, Lincoln, Manitoulin, Ontario, Ottawa-Carleton, Peel, York; Bruce and Northumberland reported by R.Ireland and S. Cain | CANM, DUKE, F, LAF, MICH, MO, NY, TRTC, UBC, US |
| _ | Que. | Chambly, Hull, Missisquoi, Shefford | CANM, MICH, MT, NY, QFA, US, WTU |
| _ | Sask. | [Carleton, Duck | CANM, |

| | | | |
|---|---|---|---|
| | | Lake] | MICH |
| _ | Ala. | Conecuh, Houston | CANM, DUKE, NY |
| _ | Ark. | Clark, Pike | HEND |
| _ | Conn. | Hartford, Middlesex, New Haven | CANM, DUKE, F, LAF, MICH, NBM, NY, QFA, US |
| _ | Fla. | Alachua, Citrus, Dixie, Duval, Gadsden, Hamilton, Hernando, Leon, Liberty, Manatee, Polk, Sarasota, Seminole, Union, Wakulla, Walton | CANM, COLO, DUKE, F, ISC, LAF, MICH, MO, MT, NBM, NY, QFA, UBC, US, WTU |
| _ | Ga. | Charlton, Greene, Long | CANM, DUKE, NY |
| _ | Ill. | Champaign, Coles, Jersey | ISC, MICH, MO |
| _ | Ind. | Lagrange, Putnam | COLO, NY |
| _ | Iowa | Dickinson, Jasper, Louisa, Muscatine, Polk, Poweshiek, Tama | CANM, COLO, DUKE, ISC, MICH, MO, NY, US, WTU |
| _ | Kans. | Ellsworth, Harvey, Reno | NY |
| _ | Ky. | Rowan | DUKE, NY |
| _ | La. | Acadia, Allen, Bossier, Caddo, Catahoula, Evangeline, Jefferson, Lafayette, La Salle, | CANM, COLO, DUKE, ISC, LAF, MICH, MO, NY, US |

| | | | |
|---|---|---|---|
| | | Livingston, Natchitoches, St. Landry, Tangipahoa | |
| _ | Maine | Penobscot, York | CANM, MCTC, NY |
| _ | Md. | Baltimore, Baltimore City, Carroll, Harford, Prince Georges | CANM, DUKE, MICH, MO, US |
| _ | Mass. | Essex, Middlesex, Suffolk | MO, NBM, NY |
| _ | Mich. | Marquette, Monroe, Ontonagon, Washtenaw | ISC, MICH, TRTC |
| _ | Minn. | Winona | CANM, COLO, F, MCTC, MO, MONT, NBM, NY, QFA, WTU, US |
| _ | Miss. | Lauderdale, Panola | DUKE, NY |
| _ | Mo. | Cedar, Franklin, Iron, St. Charles, St. Clair, St. Genevieve, Saline | MO, MT. NY, US |
| | Nebr. | Lancaster | DUKE |
| | N.H. | not given | NY |
| | N.J. | Atlantic, Bergen, Burlington, Camden, Essex | CANM, MICH, MO, NBM, NY, UBC, US |
| | N.Y. | Bronx, Cayuga, Orange, Richmond, Rockland, Suffolk, Tompkins | CANM, DUKE, ISC, NY, US |

| | | | |
|---|---|---|---|
| | N.C. | Alexander, Columbus, Durham, Greene, Mecklenberg, Orange | CANM, DUKE, MO, NY, TENN, WTU |
| | Ohio | Athens, Brown, Franklin, Pike | DUKE, ISC, MICH, NY, US |
| | Pa. | Bucks, Lehigh, Northampton, | MICH, MO, NY |
| | S.C. | Jasper, Marion | DUKE, US |
| | Tenn. | Blount, Fentress, Knox, White | CANM, COLO, DUKE, F, LAF, MICH, MO, NBM, NY, QFA, TENN, TRTC, UBC, WTU, A. C. Risk |
| | Tex. | Harris; Jim Hogg; Travis reported by E. Whitehouse | BRIT |
| | Va. | Frederick, Greensville, Loudon | NY, US |
| | W.Va. | Pocahontas | US |
| | Wis. | Barron | NY |

# Lichen flora of the eastern Mojave Desert: Blackrock Arizona, Mojave County, Arizona, USA

Heather Bird Jackson, Steven D. Leavitt, Thomas Krebs, Larry L. St. Clair[1]

**Abstract** -- Based on field identifications and collections made at several sites near Black Rock Road (extreme northwestern Arizona) the authors report 25 genera and 43 lichen species. These numbers are very similar to collections reported from similar sites in the Mojave Desert of Southeastern California (24 genera and 40 species). Collections from a gypsiferous site include two previously unreported taxa.

**Keywords** -- Lichens, Mojave Desert, Arizona

## Introduction

**Previous work** -- Only limited reports concerning the lichen flora of the Mojave Desert, in the southwestern United States, are available. Hasse (1913) listed a number of lichens for the Mojave Desert in his treatment of the lichen flora of Southern California. A checklist of lichen species for the Sweeney Granite Mountains Desert Research Center, consisting of 63 lichen species (35 genera), was published by Doell (1999). Recently, 40 lichen species in 24 genera were reported from

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two sites in the California Mojave Desert by Knight et al. (2002). A soon to be published paper from Snow Canyon, Washington County, Utah will report on the lichens from the northern limit of the Mojave Desert particularly at its point of contact with the Great Basin and Colorado Plateau geologic provinces. In this study, we further extend our study of Mojave Desert lichens by investigating a site located near the eastern border of the Mojave Desert, along Blackrock Road in the extreme northwestern corner of Arizona.

Previous studies have noted some unique attributes of the Mojave lichen flora. Biological soil crusts of the Mojave Desert are not as species rich or abundant as comparable terricolous communities in the Great Basin and Colorado Plateau (Johansen et al. 2001). In those rare instances when corticolous and lignicolous lichens are found, they occur chiefly on Blackbrush (*Coleogyne* ramossissima) and Creosote bush (*Larrea tridentata;* (Hasse 1913). Knight et al. (2002) also noted that due to the intense summer light and heat compounded by extreme drought conditions typical of the Mojave Desert saxicolous lichen communities are commonly best developed on the north facing aspects of rock outcrops, particularly basalt.

**Study area** -- Lichens were identified/collected in the general vicinity of Blackrock Road, 1.6 km south of the Utah-Arizona border, in Mojave County, Arizona (elevation 1058 m; 36° 58.552' North Latitude; 113° 38.650' West Longitude). Identifications were made from specimens occurring on Kaibab and Moenkopi rock outcrops, soil, and bark/wood of Creosote shrubs. The fieldwork phase of this project was conducted in a flat open shrubland along Blackrock Road progressing upslope into a vegetated drainage with abundant rock outcrops.

**Vascular plants** -- The flat, lower portion of the study area was dominated by Creosote bush (*Larrea tridentata*) of various ages and Ephedra (*Ephedra nevadensis*). Shrub interspaces were occupied mainly by annual species including Downy Brome (*Bromus tectorum*), Ripgut Brome (*Bromus rubens*), and Filaree (*Erodium cicutarium*). Upper areas were dominated by Barrel cactus *(Ferocactus spp.)*, Cholla (*Opuntia echinocarpa*), Broomsnake weed (*Guitierrezia sarothrae*), Range Ratny (*Krameria parvifolia*) and White Ambrosia (*Ambrosia dumosa*). The shrub inter-space contained the same basic group of annuals found in the flat area, although specific locations where cattle have not been able to graze, because of slope or rock cover, some perennials still persist. These perennials include Desert Marigold (*Baileya multiradata*), (*Hilaria rigidula*), Indian ricegrass (*Oryzopsis hymenoides*), and winterfat (*Ceratoides lanata*). Other less common vascular plants at this site include (in alphabetical order): *Amsinckia spp., Aristida purpurea, Baileya multiradiata, Brickellia atractyloide, Bromus diandrus, Bromus tectorum, Calochortus flexuosus, Ceratoides lanata, Chrysothamus spp., Echinocactus spp., Encelia frutescens, Eriogonum inflatum, Eriogonum fasciculatum, Erioneuron pulchellum, Grayia spinosa, Gutierrezia sarothrae, Hilaria rigida, Krameria parvifolia, Opuntia spp., Oryzopsis hymenoides, Poa secunda, Sarcobatus vermiculatus, Sphaeralcea ambigua,* and *Tridens muticus.*

## Materials and Methods

**Identification of specimens** -- Lichen samples were identified/collected from several substrates, including limestone, conglomerate rock, soil and the bark at the base of Creosote (*Larrea tridentata*) shrubs.

Specimens were identified using standard lichen keys and taxonomic treatises. Those specimens, which could not be identified in the field, were collected and returned to the laboratory where they were further studied and compared with herbarium material. Standard chemical spot tests and TLC analysis were used to finalize species identifications. Lichen specimens collected during the fieldwork phase of this project are deposited in the Herbarium of Nonvascular Cryptogams at Brigham Young University (BRY) in Provo, Utah, USA.

**Organization of lichen species list --** Relative abundance and substrates are listed after each species. Our scale of relative abundance is rare<common<abundant. Relative abundance was evaluated according to the following scale: rare = 1-2 encounters, common = 3-9 encounters, and abundant ≥ 10 encounters.

## Taxonomic Checklist

ACAROSPORA BULLATA. Locally common on rock.

ACAROSPORA FUSCATA. Common to abundant on rock.

ACAROSPORA NODULOSA var. NODULOSA. Rare to locally common on gypsiferous soil. Note: this taxon is gypsifilous and extremely rare in the western United States; most likely it is a new record for the state of Arizona.

ACAROSPORA PELTASTICA. Rare on rock.

ACAROSPORA STRIGATA. Common to abundant on rock.

ASPICILIA CALIFORNICA. Rare on gypsiferous soil.

ASPICILIA DESERTORUM. Rare to locally common on rock.

CALOPLACA DECIPIENS. Rare on rock.

CALOPLACA SAXICOLA. Rare to locally common on rock.

CANDELARIELLA DEFLEXA. Rare on bark of Creosote shrubs.

CANDELARIELLA ROSULANS. Common to abundant on soil over rock.

CANDELARIELLA VITELLINA. Common or rock.

COLLEMA FUSCOVIRENS. Rare on shaded, vertical surfaces of rocks.

COLLEMA TENAX. Locally common on open soil surfaces in inter-shrub spaces.

DERMATOCARPON MINIATUM. Rare to locally common on shaded, vertical surfaces of rocks.

ENDOCARPON PUSILLUM. Rare on open soil surfaces in inter-shrub spaces.

FULGENSIA BRACTEATA. Locally common on open soil surfaces in inter-shrub spaces.

LECANORA ARGOPHOLIS. Rare to locally common on rock.

LECANORA GAROVAGLII. Rare to locally common on rock.

LECANORA MURALIS. Rare to locally common on rock.

LECANORA VALESIACA. Rare on rock.

LECIDEA TESSELATA. Locally common on rock.

LECIDELLA STIGMATEA. Rare to locally common on rock.

LOBOTHALLIA ALPHOPLACA. Rare to locally common on rock.

LOBOTHALLIA PRAERADIOSA. Rare on rock.

PELTULA OBSCURANS. Locally common on soil.

PHAEOPHYSCIA KAIRAMOI. Rare on soil over rock; found only on shaded, vertical surfaces.

PHYSCIA CAESIA. Rare on shaded, vertical surfaces of rocks.

PLACIDIUM SQUAMULOSUM. Locally common on soil over rock or on open soil surfaces in inter-shrub spaces.

PLEOPSIDIUM CHLOROPHANUM. Common to abundant on vertical rock surfaces.

PLEOPSIDIUM FLAVUM. Locally common on rock.

PSORA CEREBRIFORMIS. Rare on open soil surfaces in inter-shrub spaces.

PSORA CRENATA. Locally common to abundant on soil surfaces in upper rocky areas.

PSORA DECIPIENS. Locally common to abundant on soil surfaces in upper rocky areas and at gypsiferous site.

PSORA TUCKERMANII. Rare to locally common on soil and soil over rock in upper rocky area.

SQUAMARINA LENTIGERA. Rare on gypsiferous soil surfaces.

STAUROTHELE AREOLATA. Rare to common on rock.

THYREA CONFUSA. Rare to locally common on rock.

TONINIA SEDIFOLIA. Rare on soil over rock or on open soil surfaces in inter-shrub spaces.

XANTHOMENDOZA FALLAX. Locally common on bark of Creosote shrubs.

XANTHOPARMELIA AJOENSIS. Rare on rock.

XANTHOPARMELIA PLITTII. Rare to locally common on rock.

XANTHORIA ELEGANS. Rare to locally common on rock.

**Discussion --** The Black Rock Road lichen community intergrades between the Snow Canyon community and the more distinctly Mojave Desert communities in Southern California. Several previously unreported species were found at the Black Rock site largely due to the gypsiferous soil area. New reports from the gypsiferous site, include –*Acarospora nodulosa* var. *nodulsa,* and *Squamarina lentigera. Psora* *crenata* also represents a new report for the Mojave Desert. *Xanthoparmelia ajoensis* is also a new to the Mojave Desert but certainly its occurrence at the Black Rock Road site falls within its predicted range.

## References

Doell, J. 1999. Lichens of the Sweeney Granite Mountains Desert Research Center and environs. Bulletin of the California Lichen Society 6:8-12.

Hasse, H. 1913. Lichen Flora of Southern California. Contributions from the United States Herbarium 17:1-131.

Johansen, J. R., C. Britton, T. C. Rosati, L. Xuesong, L. L. St. Clair, B. L. Webb, A. J. Kennedy et al. 2001. Microbiotic crusts of the Mojave Desert: factors influencing distribution and abundance. Nova Hedwigia 123:339-370.

Knight, K. B., D. R. Clements, L. F. Gordillo, J. I. Jefferies, D. Tilley, T. J. Workman, A. F. Lloyd, and L. L. St. Clair. 2002. The lichen flora of two sites in the Mojave Desert, California, USA. Mycotaxon 84: 27-32.

# NPLichen: A Database of Lichens in the U. S. National Parks

James P. Bennett[1] and Clifford M. Wetmore[2]

March 1, 2005

**NPLichen**, a database of lichens in the U. S. National Parks (Wetmore and Bennett, 1992), has been extensively revised and expanded, and is now available for public use at www.ies.wisc.edu/nplichen. As of this writing, the database contains 25,995 records of lichens in 144 national park units. The number of records of lichens not in the North American lichen checklist (Esslinger 1997) is 161, for a total of 26,156. These records include multiple occurrences of a species in some parks because more than one reference has reported presence of species. Consequently, the number of species in parks records (including new to North America) without these duplicate references is 14,986. Our table of misidentified taxa contains 307 records.

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The number of genera in the database is 375, and the number of taxa is 2435. This represents roughly 74% and 68% respectively of the North American flora.

The total number of references cited in the database is 453. The number of references per park ranged from 1 (several parks) to 66 (Isle Royale) and averaged 8.5.

The 144 parks in the database are found in 43 states and Washington, D.C.(a map of the parks is available at the website.)

The average number of lichen species per park is 104, while the median is 60. This is because the distribution of species per park is skewed to the right, there being a small number of parks with large numbers of species. Most parks are not well known.

There are 115 records of type localities in 29 park units. Great Smoky Mountains has the most number of types (25), followed by Channel Islands (18) and Santa Monica Mountains (16).

A summary of statistics on each park including the number of taxa, records, types, and how well known the flora is provided at the website.

Three queries are available at the website. The first displays a list of parks in the database in a drop down box. After selecting a park, the user checks off if they want the list of lichens or references in the report. The lichen list includes three parts: a list of accepted names, a list of taxa not in the North American Checklist, and a list of misidentified taxa. Tallies of the total number and the number of references are also given. The date of the report is given at the bottom with an appropriate credit. Each species list displays the name of the taxon, the authority, the reference code for the citation, whether or not it is a type, and whether or not it has been verified in the park (see above).

The second query is the opposite of the first. It displays a drop down box of the species, and after the visitor submits a name the resulting report displays the parks that species is found in. The park name is displayed, followed by the same columns of reference code, type, and whether it has been verified or not, as in the previous report. Tallies are also given. Parks in which the species has been listed wrongly (i.e. misidentifications) are not included in this result set.

The third query retrieves the full citation for any reference code in the database. After the visitor selects the reference code from the drop down box, the resulting report simply displays the full citation. Multiple citations are not displayed.

A link is available on the website to download a full length report describing the methods used in detail, sources of error, updates and recommendations, disclaimers on use of the data, and acknowledgements. A more detailed scientific paper analyzing the database is in preparation.

## References

Esslinger, T. L. 1997. A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. North Dakota State University: <http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.htm> (First Posted 1 December 1997, Most Recent Update 2 March 2004), Fargo, North Dakota.

Wetmore, C. and Bennett, J. 1992. NPLICHEN: A National Park Service Lichen Data Base. Final report submitted to National Park Service. 31 pp.

## Guide to contributors to *EVANSIA*

The aim of *Evansia* is to provide a vehicle for the presentation and exchange of useful information on North American bryophytes and lichens. Articles are frequently popular in nature rather than technical and are intended to teach and inform both amateurs and professionals. The articles include, but are not restricted to, announcements of and reports on forays and meetings, presentations of techniques and aids for studying and curating lichens and bryophytes, and reports on local floras. Checklists and papers documenting new regional, state, or county records must include voucher specimens (collector and collection number) and an indication of where the specimens are deposited or a literature reference.

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# EVANSIA

Volume 22 Number 2

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*Acarospora amphibola* Wedd. in Boston Harbor
Kerry Knudsen 43 -l

Bryophytes and Lichens of Beckham County, Oklahoma, Including *Acaulon schimperianum* New to Oklahoma
Carl E. Darigo & Nels Holmberg 46 -b

Lichen Checklist for North Carolina, USA
Gary B. Perlmutter 51 -l

The Bryophyte Flora of The Cranberry Bog Preserve, Suffolk County, NY, With Notes on their Distribution.
Eric C. Morgan & Jon A. Sperling 78 b

*Tortula papillosa* and *Tortula pagorum* (Pottiaceae) in New York State
Norm Trigoboff 85 -b

Announcement Board 89

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Editors note: With this issue of *Evansia* we introduce the "Announcement Board". Please submit information about Bryological or Lichenological field trips, seminars, or meetings. Please include dates, locations and contact information. Deadlines for announcements will be March 1st (issue 1), June 1st (issue 2), September 1st (issue 3), and December 1st (issue 4).

Evansia volume 22, number 1 was distributed on 31 March 2005

# *Acarospora amphibola* Wedd. in Boston Harbor

Kerry Knudsen[1]

*Acarospora amphibola* Wedd. grows on rocks in the spray zone of the Atlantic coast in northern Europe and is especially common on the Swedish coast. Magnusson reported the species from Nova Scotia (Magnusson 1956). I have seen no other reports from North America.

*Acarospora amphibola* is a member of the *smaragdula* group with paraphyses of 1.0-1.5 in diam. at base and hyphal bands penetrating the algal layer. *Acarospora amphibola* has thin brown or brown-red squamules less than 1mm wide in contiguous thalli to several centimeters in width, apothecia elevated, usually single, with a margin formed by a true exciple, often 80 μm thick and somewhat carbonized, and with discs turning red in water. Ascospores are not diagnostic and are hyaline, non-septate and 3-5 x 1.0-1.3 μm. All spot tests are negative. As with all *Acarospora* some specimens may vary, often because of environment, making determinations difficult. Its ecological niche is distinctive and it is usually collected in the spray zone above normal high tide level. But determination strictly by ecological niche should be avoided, as I have seen coastal specimens of *Acarospora smaragdula* (Wahlenb.) A. Massal var. *smaragdula* from Long Island, New York (NY), from Maine in Salisbury County on rocks three feet above high water. C.C. Plitt (#17) July 29, 1922 (UPS) and the Boston Harbor Islands (FH). These specimens are yellowish-brown with multiple immersed reddish apothecia and are K+ red in the medulla, though norstictic acid can be lacking. The paraphyses are generally thinner, 0.5-1.0 μm in diameter at their base. I have not yet seen *Acarospora smaragdula* var. *lesdainii* (Harm. ex A.L. Sm.) H. Magn. from the East Coast.

*Acarospora amphibola* is treated as a valid species in Foucard (2001) and Santesson (2004). Unfortunately, following Clauzade and Roux (1981), *Acarospora amphibola* has been lumped with *Acarospora smaragdula* in the British flora (Purvis *et al.*1992) and the North America checklist (Esslinger 1997). The name should be added to the North American checklist.

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In Massachusetts, *Acarospora amphibola* was collected by Elisabeth Lay and Scott LaGreca on Racoon Island, Slate Island, Peddock's Island, and Thompson Island in Boston Harbor and on the narrow peninsula in Hingham, in Plymouth County, at the World's End Reservation (see LaGreca *et al.* 2005). The specimens match authentic specimens from Sweden. The species can probably be expected on the other islands of Boston Harbor and along the eastern coast from New York State north.

Specimens seen: USA: Massachusetts: Norfolk County: Boston Harbor: Racoon Island off Quincy, Elevation: 0-30 feet. E. Lay # 01-0655 (hb. Lay); Norfolk County: Slate Island, far above high tide line with *Acarospora fuscata*, Scott LaGreca #1032 (FH); Suffolk County: Thompson Island; E. Lay # 01-0001 (hb. Lay) and #01-0002 (FH); Plymouth County: Boston Harbor: Peddocks Island, Elevation: 2 meters.E. Lay# 01-0029 & # 01-0030 (FH); Plymouth County: Hingham. World's End Reservation. E. Lay# 01-0259 (FH).

Sweden: Bohuslan: Odsmal, Hallsdalen. Malme, Lichnes suecici exsiccati No. 944 (H); Sweden: Boshuslan: par Odsmal, Espetangen. On maritime rocks. Magnusson: Lichenes selecti scandinavici exsiccati No. 121 (H).

**Acknowledgment** -- The author thanks Richard Harris and Scott LaGreca for reviewing this report. Special thanks to Elisabeth Lay, Orvo Vitikainen and Roland Skytén of H., and Genevieve Lewis-Gentry of FH.

## References

Clauzade, L. and Roux, Cl. 1981. "Les *Acarospora* De L'Europe Occidentale et La Region Region Mediterraneenne" Bulletin de la Musee Histoire Marseille, 41:41-93

Esslinger, T.L. 1997.A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. North Dakota State University: http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.htm (First posted 1 December,1997, Most Recent Update July 17, 2002), Fargo, North Dakota.

Foucard, Tony. Svenska Skorplavar. 2001. Stockholm: Interpublishing. 392 pp.

LaGreca, S., E. Lay, D. Greene, E. Kneiper and M. Lincoln. 2005. The lichens and bryophytes of the Boston Harbor Islands. Northeastern Naturalist (in press).

Magnusson, A. H. 1956: A second supplement to the monograph of Acarospora with keys. - *Goteborgs Kungl. Vetensk.- & Vitterhets.- Samhalles Handl., sjatte foljden ser. B* 6(17): 1-34.

Purvis, O.W., Coppins, B.J., Hawksworth, D.L., PJames, P.W., and Moore, D.M. 1992. The Lichen Flora of Great Britain and Ireland. London: Natural History Museum Publications. 710 pp.

Stantesson, R., Moberg, R., Nordin, A., Tonsberg, T., Vitkainen, O. 2004. Lichen-forming and lichenicolous Fungi of Fennoscandia. Uppsala, Sweden: Museum of Evolution. 359 pp.

# Bryophytes and Lichens of Beckham County, Oklahoma, Including *Acaulon schimperianum* New to Oklahoma

Carl E. Darigo[1] & Nels Holmberg[2]

**Background** -- During numerous visits to his family's 360 acre farm property and other sites in Beckham County, Oklahoma, the junior author has collected a total of 29 bryophyte and lichen species, including *Acaulon schimperianum* (Sull.) Sull. *in* Sull. & Lesq., new to the state. While this number of species may seem small, the climate and topography of western Oklahoma, as described below, is not conducive to aggressive plant growth.

**Description of Beckham County** -- The western side of Beckham County lies along the the 100th Meridian. This part of the 100th Meridian in Beckham County forms the Oklahoma/Texas state boundary. The County is at the eastern edge of the Great Plains, which here is broken by occasional gypsum outcrops and is bisected by the North Fork of the Red River. Historic Route 66, now replaced by Interstate-40, runs east-west through the County. Beckham County covers 904 square miles, and its elevation ranges from 1,630 feet in the southeast to 2,245 feet in the northwest.

Morris (1997) lists three natural vegetation types for Beckham County: mixed grasses, shinnery oak and mesquite. The mixed grass region is formed in the area in which the tall grass and short grass prairies meet. The shinnery oak community (Peterson 1998) occurs on the sandy areas, which are highly susceptible to wind erosion when farmed; shinnery oak (*Quercus harvardii* Rydb.) is a shrubby plant, adapted to sand habitat. The mesquite area occurs in the southern portion of Beckham County, where a mostly short grass type vegetation covers steep, eroded gypsum hills, commonly called "breaks"; good examples of the mesquite community can be seen at the Sandy Sanders Wildlife Management Area. A more detailed description of plant community types can be found in Hoagland (2001).

The climate of the region is hot and dry, with 25 inch average rainfall. July is the warmest month with a 96°F. and 68°F. average high and low.

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January is the coldest month with a 51°F. and 22°F. average high and low. These data are from a weather reporting station in the western part of the county, 4 miles east of Erick on the Holmberg family farm. Average frost-free days per year range from 208 in the northwest to 221 in the southeast areas of the County (Morris 1997).

The County is a farming area with a population in 2000 of 19,799, little changed from the 1910 population of 19,699. The population dropped after the Dust Bowl era of the 1930's and drought years of the 1950's, but rebounded with periodic oil and natural gas discoveries. Cotton and cattle were historically the main farm products, with cotton now replaced by peanuts; much of the land is in the Conservation Reserve Program.

Beckham County was included in the 1803 Louisiana Purchase, and originally was part of Greer County, Texas. In 1896 Beckham County entered the Oklahoma Indian Territory, which subsequently became the state of Oklahoma in 1907.

**Determinations and Checklist** -- Determinations were made by the senior author. More difficult taxa were confirmed by Bruce Allen (mosses), and Doug Ladd (lichens). All collections were made by Nels Holmberg; the collection numbers listed are his. The bryophytes are at MO with duplicates at OKL, and the lichen collections are at OKL. All of the mosses (Bowers 1991) except *Orthotrichum diaphanum* Brid., and the liverworts (Little 1936) are county records. A state-wide range distribution of lichens could not be found in the literature.

MOSSES

AMBLYSTEGIACEAE

***Campylium hispidulum*** (Brid.) Mitt. On sandy soil, North Fork of Red River, 5 mi. N of Texola, *331*.

BRYACEAE

***Bryum argenteum*** Hedw. On disturbed soil, old US Hwy 66, 5 mi. NE of Erick, *36*.

***B. caespiticium*** Hedw. On moist sandy soil, Holmberg property, 4 mi. E of Erick, *111*.

***B. capillare*** Hedw. var. ***capillare*** On soil near creek, Holmberg property, 3_ mi. E of Erick, *34*.

***B. dichotomum*** Hedw. On disturbed soil, old US Hwy 66, 5 mi. NE of Erick, *109*.

FUNARIACEAE

***Funaria flavicans*** Michx. On moist disturbed soil near shed, Holmberg property, 4 mi. E of Erick, *210.*

GRIMMIACEAE

***Jaffueliobryum raui*** (Aust.) Thér. On tombstone, Erick Cemetery, 1_ mi. SE of Erick, *252.*

ORTHOTRICHACEAE

***Orthotrichum diaphanum*** Brid. On bark, Kendall property, 3_ mi. E of Erick, *329.* This species was collected by the senior author (Darigo, 2000) in 1999, from bark at the I-40 west-bound rest area, 3 mi. NE of Erick, Beckham County.

POTTIACEAE

***Acaulon schimperianum*** (Sull.) Sull. *in* Sull. & Lesq. This collection was made 22 October 2003, and represents a new Oklahoma state record. The plants grew in scattered, small patches on shaded, bare, red, sandy soil near Timber Creek, Doxey Community Area, at 1,900 feet elevation, 5 mi. NE of Sayre, *206.* Crum & Anderson (1981) report the range for this species as Arizona, Texas, Illinois, and Iowa. .

***Phascum cuspidatum*** Hedw. On disturbed soil, old US Hwy 66, 5 mi. NE of Erick, *108.*

***Syntrichia pagorum*** (Milde) Amann On bark, roadside, 8 mi. N of Texola, *332.*

***Tortula plinthobia*** (Sull. & Lesq.) Sull. On rock, Holmberg property, 3_ mi. E of Erick, *33.*

***Weissia controversa*** Hedw. On moist soil, Sandy Sanders Wildlife Management Area, *29.*

***W. jamaicensis*** (Mitt.) Grout On sandy soil, old US Hwy 66, 3_ mi. E of Erick, *110.*

***W. sharpii*** Anderson & Lemmon On pasture soil, Holmberg property, 4 mi. E of Erick, *26.*

LIVERWORTS

AYTONIACEAE

***Reboulia hemisphaerica*** (L.) Raddi On moist soil, Sandy Sanders Wildlife Management Area, *30.*

LEJEUNEACEAE

***Leucolejeunea clypeata*** (Schwein.) Evans On native grass prairie soil, Holmberg property, 3_ mi. E of Erick, *120.*

LICHENS

CANDELARIACEAE

***Candelaria concolor*** (Dicks.) Stein On bark, Holmberg property, 3_ mi. E of Erick, *104.*

CLADONIACEAE

***Cladonia macilenta*** Hoffm. var. ***bacillaris*** (Genth) Schaer. On soil of sand prairie, Kendall property, 3_ mi. E of Erick, *330.*

HEPPIACEAE

***Heppia adglutinata*** (Kremp.) A. Massal. On moist, disturbed soil, Holmberg property, 4 mi. E of Erick, *255.*

PHYSCIACEAE

***Hyperphyscia syncolla*** (Tuck. ex Nyl.) Kalb On bark, Erick Cemetery, 1_ mi. SE of Erick, *254.*

***Physcia stellaris*** (L.) Ach. On tree branch, Holmberg property, 3_ mi. E of Erick, *38.*

***Physciella chloantha*** (Ach.) Essl. On bark, Holmberg property, 3_ mi. E of Erick, *62.*

TELOSCHISTACEAE

***Caloplaca flavovirescens*** (Wulfen) Dalla Torre & Sarnth. On tombstone, Erick Cemetery, 1_ mi SE of Erick, *253.*

***C. microphyllina*** (Tuck.) Hasse On shed siding boards, Holmberg property, 4 mi. E of Erick, *105.*

***Teloschistes chrysophthalmus*** (L.) Th. Fr. On bark, Holmberg property, 3_ mi. E of Erick, *103.*

***Xanthoria fallax*** (Hepp) Arn. On bark, 1 mi. S of I-40, 7 mi. E of Erick, *63.*

***X. fulva*** (Hoffm.) Poelt & Petutschnig On tree branch, Holmberg property, 3_ mi. E of Erick, *39.*

***X. montanum*** L. Lindbloom On shrub, old US Hwy 66, 5 mi. NE of Erick, *43.*

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## References

Bowers, F. D. 1991. Checklist of Oklahoma Mosses. University of Wisconsin, Stevens Point. 32 pp.

Crum, H. A. & L. E. Anderson. 1981. Mosses of Eastern North America. Vol. 1. Columbia University Press, New York.

Darigo, C. 2000. Bryophytes from the States of Illinois, Missouri and Oklahoma; New County Records. Evansia 17: 56–60.

Hoagland, B. 2001. The Vegetation of Oklahoma: A Classification for Landscape Mapping and Conservation Planning. The Southwestern Naturalist 45: 386-412.

Little, E. L. 1936. The Liverworts of Oklahoma. Bryologist 39: 25-34.

Morris, J. W., C. R. Greene & E. C. McReynolds. 1997. Historical Atlas of Oklahoma. University of Oklahoma Press, Norman & London. 3rd Edition.

Peterson, R. S. & C. S. Boyd. 1998. Ecology and Management of Sand-Shinnery Communities: A Literature Review. U. S. Department of Agriculture General Technical Report RMRS-GTR-16, Fort Collins CO.

# Lichen Checklist for North Carolina, USA

Gary B. Perlmutter[1]

**Abstract** -- A checklist of lichens from a thorough literature review of both printed and online resources covering North Carolina, USA is presented. This list contains over 600 taxa from the state.

While preparing a report for an herbaria review I had conducted for lichens of the Piedmont of North Carolina, I found it necessary to compile a checklist for the state to verify reviewed taxa as already reported or as new. The only existing checklist for North Carolina is from a website from the University of Hamburg, Germany (www.biologie.uni-hamburg.de/checklists/), which I found to be inadequate for my review. Therefore, I conducted a more thorough review of the literature, including both printed and online sources, from early papers (e.g. Oosting and Anderson 1937) to the most recent online publications (e.g. USGS 2005). The resulting checklist includes 605 lichen taxa and is the most complete listing of lichens of North Carolina to date.

**Acknowledgements** -- I would like to thank Carol Ann McCormick of the University of North Carolina Herbarium (NCU) for providing some early printed material. I am also indebted to North Carolina Botanical Garden (NCBG) Director Peter White for suggesting I conduct a lichen inventory for the Garden, and Assistant Director Johnny Randall, whose advisorship this project is under. This report in part meets the Final Project requirement of the NCBG Native Plant Studies certificate program.

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Lichen checklist for North Carolina from literature review. Nomenclature follows Esslinger (1997) with synonyms as found in the literature. References are as first appeared in the literature.

| Taxon | Reference |
|---|---|
| Acarospora fuscata (Schrader) Arnold | Brodo et al. 2001 |
| Acarospora glaucocarpa (Ach.) Körber | Brodo et al. 2001 |
| Ahtiana aurescens (Tuck. ex Riddle) Goward & Thell (Syn.: Cetraria aurescens, Tuckermannopsis aurescens) | Dey 1978 |
| Alectoria fallacina Mot. | Dey 1978 |
| Allocetraria oakesiana (Tuck.) Randlane & Thell (Syn.: Cetraria oaksiana, Tuckermannopsis oaksaina) | Perry & Moore 1969 |
| Amandinea langloisii Imshaug ex Marbach | Lendemer & Yahr 2004 |
| Amandinea milliaria (Tuck.) P. May & Sheard | Lendemer & Yahr 2004 |
| Amandinea polyspora (Willey) E. Lay & P. May | Lendemer & Yahr 2004 |
| Amandinea punctata (Hoffm.) Coppins & Scheid. (Syn.: Buellia punctata) | Brodo et al. 2001 |
| Anaptychia palmulata (Michaux) Vainio | Perry & Moore 1969 |
| Anaptychia setifera Räsänen | NatureServe 2005 |
| Anisomeridium biforme (Borrer) R. C. Harris | Lendemer & Yahr 2004 |
| Anthracothecium nanum (Zahlbr.) R. C. Harris | Lendemer & Yahr 2004 |
| Anzia americana Yoshim. & Sharp | NatureServe 2005 |
| Anzia colpodes (Ach.) Stizenb. | Perry & Moore 1969 |
| Anzia ornata (Zahlbr.) Asah. | NatureServe 2005 |
| Arctoparmelia incurva (Pers.) Hale (Syn.: Parmelia incurva) | Dey 1978 |
| Arthonia albovirescens Nyl. | Lendemer & Yahr 2004 |
| Arthonia caesia (Flotow) Körber | Brodo et al. 2001 |
| Arthonia cinnabarina (DC.) Wallr. | Brodo et al. 2001 |
| Arthonia rubella (Fée) Nyl. | Lendemer & Yahr 2004 |
| Arthopyrenia cinchonae (Ach.) Müll. Arg. | Lendemer & Yahr 2004 |
| Arthopyrenia degelii R. C. Harris | Harris 1995 |
| Arthothelium interveniens (Nyl.) Zahlbr. | Lendemer & Yahr 2004 |
| Arthothelium taediosum (Nyl.) Müll. Arg. | Lendemer & Yahr 2004 |
| Aspicilia cinerea (L.) Körber (Syn.: Lecanora cinerea) | Brodo et al. 2001 |

| Taxon | Reference |
|---|---|
| Bacidia heterochroa (Müll. Arg.) Zahlbr. | Lendemer & Yahr 2004 |
| Bacidia polychroa (Th. Fr.) Körber | Lendemer & Yahr 2004 |
| Bacidia rubella (Hoffm.) A. Massal. | Brodo et al. 2001 |
| Bacidia schweinitzii (Fr. ex E. Michener) A. Schneider | Brodo et al. 2001 |
| Bacidina egenula (Nyl.) Vezda | Lendemer & Yahr 2004 |
| Bactrospora mesospora R.C. Harris | Lendemer & Yahr 2004 |
| Baculifera curtisii (Tuck.) Marbach (Syn.: Buellia curtisii) | Lendemer & Yahr 2004 |
| Baculifera imshaugiana (R. C. Harris) Marbach (Syn.: Buellia imshaugiana) | Lendemer & Yahr 2004 |
| Bathelium carolinianum (Tuck.) R. C. Harris | Lendemer & Yahr 2004 |
| Baeomyces rufus (Hudson) Rebent. | Dey 1978 |
| Biatora pontica Printzen & Tønsberg | Printzen & Tønsberg 2003 |
| Biatora printzenii Tønsberg | Tønsberg 2002 |
| Brigantiaea leucoxantha (Sprengel) R. Sant. & Hafellner | Brodo et al. 2001 |
| Bryoria bicolor (Ehrh.) Brodo & D. Hawksw. (Syn.: Alectoria bicolor) | Perry & More 1969 |
| Bryoria furcellata (Fr.) Brodo & D. Hawksw. (Syn.: Alectoria nidulifera) | Perry & More 1969 |
| Bryoria nadvornikiana (Gyelnik) Brodo & D. Hawksw. (Syn.: Alectoria nadvornikiana) | Perry & More 1969 |
| Bryoria tenuis (E. Dahl) Brodo & D. Hawksw. Syn (Syn.: Alectoria tenuis) | Dey 1978 |
| Bryoria trichodes subsp. americana (Mot.) Brodo & D. Hawksw. (Syn.: Alectoria americana) | Perry & More 1969 |
| Buellia curatellae Malme | USGS 2005 |
| Buellia spuria (Schaerer) Anzi | Brodo et al. 2001 |
| Buellia stillingiana J. Steiner | Brodo et al. 2001 |
| Bulbothrix confoederata (Culb.) Hale | Brodo et al. 2001 |
| Bulbothrix goebelii (Zenker) Hale | McCune et al. 1997 |
| Bulbothrix isidiza (Nyl.) Hale | Dey 1987 |
| Byssoloma leucoblepharum (Nyl.) Vainio | Lendemer & Yahr 2004 |
| Byssoloma meadii (Tuck.) S. S. Ekman | Brodo et al. 2001 |
| Byssoloma subdiscordans (Nyl.) P. James | Lendemer & Yahr 2004 |
| Calicium abietinum Pers. | Lendemer & Yahr 2004 |

| Taxon | Reference |
|---|---|
| Calicium hyperelloides Nyl. | Lendemer & Yahr 2004 |
| Calicium trabinellum (Ach.) Ach | Lendemer & Yahr 2004 |
| Caloplaca cerina (Ehrh. ex Hedwig) Th. Fr. | Brodo et al. 2001 |
| Caloplaca chrysophthalma Degel. | Lendemer & Yahr 2004 |
| Caloplaca cinnabarina (Ach.) Zahlbr. | Wetmore & Kärnefelt 1999 |
| Caloplaca citrina (Hoffm.) Th. Fr. | Brodo et al. 2001 |
| Caloplaca ferruginea (Hudson) Th. Fr. | USGS 2005 |
| Caloplaca flavovirescens (Wulfen) Dalla Torre & Sarnth. | Brodo et al. 2001 |
| Candelaria concolor (Dickson) Stein | Perry & Moore 1969 |
| Candelaria fibrosa (Fr.) Müll. Arg. | Perry & Moore 1969 |
| Candelariella efflorescens R. C. Harris & W. R. Buck | Brodo et al. 2001 |
| Candelariella vitellina (Hoffm.) Müll. Arg. | USGS 2005 |
| Canomaculina haitiensis (Hale) Elix (Syn.: Parmotrema haitiense) | Lendemer & Yahr 2004 |
| Canomaculina neotropica (Kurok.) Elix (Syn.: Parmotrema neotropicum) | Heiman 1996 |
| Canomaculina subsumpta (Nyl.) Elix (Syn.: Parmotrema subsumptum) | McCune et al. 1997 |
| Canomaculina subtinctoria (Zahlbr.) Elix (Syn.: Parmotrema subtinctorium, Parmelia subcrinita) | Perry & Moore 1969 |
| Canoparmelia amabilis Heiman & Elix | Heiman & Elix 1999 |
| Canoparmelia amazonica (Nyl.) Elix & Hale | Lendemer & Yahr 2004 |
| Canoparmelia caroliniana (Nyl.) Elix & Hale (Syn.: Parmelia caroliniana) | Perry & Moore 1969 |
| Canoparmelia crozalsiana (B. de Lesd. ex Harm.) Elix & Hale | Heiman 1996 |
| Canoparmelia texana (Tuck.) Elix & Hale | Brodo et al. 2001 |
| Cetradonia linearis (Evans) J.-C. Wei & Ahti (Syn.: Cladonia linearis, Gymnoderma lineare) | Perry & More 1969 |
| Cetraria aculeata (Schreber) Fr. | Mozingo 1954 |
| Cetraria arenaria Kärnefelt | Heiman 1996 |
| Cetraria islandica (L.) Ach. subsp. islandica | Perry & Moore 1969 |
| Cetrelia cetrarioides (Duby) Culb. & C. Culb. | Dey 1978 |
| Cetrelia chicitae (Culb.) Culb. & C. Culb. | Perry & Moore 1969 |
| Cetrelia olivetorum (Nyl.) Culb. & C. Culb. | Perry & Moore 1969 |

| Taxon | Reference |
|---|---|
| Chaenotheca brunneola (Ach.) Müll. Arg. | Brodo et al. 2001 |
| Chaenothecopsis debilis (Turner & Borrer ex Sm.) Tibell (Saprophytic fungus related to lichens or lichenicolous fungi) | Lendemer & Yahr 2004 |
| Chrysothrix candelaris (L.) J. R. Laundon (Syn.: Lepraria flava) | Brodo et al. 2001 |
| Chrysothrix flavovirens Tønsberg s. lat. | Lendemer 2005 |
| Ciposia wheeleri (R. C. Harris) Marbach (Syn.: Buellia wheeleri) | Lendemer & Yahr 2004 |
| Cladonia anitae Culb. & C. Culb. | Culberson et al. 1982 |
| Cladonia apodocarpa Robbins | Keever et al. 1951 |
| Cladonia arbuscula (Wallr.) Flotow (Syn.: Cladina arbuscula, Cladonia sylvatica) | Oosting & Anderson 1937 |
| Cladonia beaumontii (Tuck.) Vainio | Brodo et al. 2001 |
| Cladonia caespiticia (Pers.) Flörke | Oosting & Anderson 1937 |
| Cladonia caroliniana Tuck. | Oosting & Anderson 1939 |
| Cladonia cenotea (Ach.) Schaerer | Perry & Moore 1969 |
| Cladonia cervicornis (Ach.) Flotow subsp. cervicornis | Heiman 1996 |
| Cladonia cervicornis subsp. verticillata (Hoffm.) Ahti (Syn.: Cladonia verticillata) | Perry & Moore 1969 |
| Cladonia chlorophaea (Flörke ex Sommerf.) Sprengel | Perry & Moore 1969 |
| Cladonia ciliata var. tenuis (Flörke) Ahti (Syn.: Cladonia tenuis) | Oosting & Anderson 1937 |
| Cladonia coccifera (L.) Willd. | Oosting & Anderson 1937 |
| Cladonia coniocraea (Flörke) Sprengel | Oosting & Anderson 1937 |
| Cladonia crispata (Ach.) Flotow var. crispata | Brodo et al. 2001 |
| Cladonia cristatella Tuck. | Keever et al. 1951 |
| Cladonia cryptochlrophaea Asah. | Perry & Moore 1969 |
| Cladonia cylindrica (A. Evans) A. Evans | Heiman 1996 |
| Cladonia didyma (Fée) Vainio | Perry & Moore 1969 |
| Cladonia didyma var. vulcanica (Zoll. & Moritzi) Vainio (Syn.: Cladonia vulcanica) | McCune et al. 1997 |
| Cladonia digitata (L.) Hoffm. | Dey 1978 |

| Taxon | Reference |
|---|---|
| Cladonia dimorphoclada Robbins | Brodo et al. 2001 |
| Cladonia evansii Abbayes (Syn.: Cladina evansii) | Brodo et al. 2001 |
| Cladonia fimbriata (L.) Fr. | Oosting & Anderson 1937 |
| Cladonia floerkeana (Fr.) Flörke | Oosting & Anderson 1937 |
| Cladonia floridana Vainio | Brodo et al. 2001 |
| Cladonia furcata (Hudson) Schrader | Oosting & Anderson 1937 |
| Cladonia gracilis (L.) Willd. subsp. gracilis (Syn.: Cladonia gracilis) | Perry & Moore 1969 |
| Cladonia grayi G. Merr. ex Sandst. | Keever et al. 1951 |
| Cladonia humilis (With.) J. R. Laundon | Heiman 1996 |
| Cladonia incrassata Flörke | Oosting & Anderson 1937 |
| Cladonia leporina Fr. | Oosting & Anderson 1939 |
| Cladonia macilenta Hoffm. | Heiman 1996 |
| Cladonia macilenta var. bacillaris (Genth) Schaerer (Syn.: Cladonia bacillaris) | Keever et al. 1951 |
| Cladonia mateocyatha Robbins | Robinson 1959 |
| Cladonia merochlorophaea Asah. | Dey 1978 |
| Cladonia mitis Sandst. (Syn.: Cladina mitis) | Oosting & Anderson 1937 |
| Cladonia ochrochlora Flörke | McCune et al. 1997 |
| Cladonia pachycladodes Vainio | Brodo et al. 2001 |
| Cladonia parasitica (Hoffm.) Hoffm. (Syn.: Cladonia delicata) | Robinson 1959 |
| Cladonia peziziformis (With.) J. R. Laundon (Syn.: Cladonia capitata) | Robinson 1959 |
| Cladonia piedmontensis G. Merr. | Keever et al. 1951 |
| Cladonia pleurota (Flörke) Schaerer | Perry & Moore 1969 |
| Cladonia polycarpoides Nyl. | Heiman 1996 |
| Cladonia psoromica J. P. Dey | Dey 1973 |
| Cladonia pyxidata (L.) Hoffm. | Oosting & Anderson 1937 |
| Cladonia ramulosa (With.) J. R. Laundon (Syn.: Cladonia pityrea) | McCune et al. 1997 |
| Cladonia rangiferina (L.) F. H. Wigg. (Syn.: | Oosting & Anderson |

| Taxon | Reference |
|---|---|
| Cladina rangiferina) | 1937 |
| Cladonia rappii A. Evans (Syn.: Cladonia calycantha) | Brodo et al. 2001 |
| Cladonia rei Schaerer (Syn.: Cladonia nemoxyna) | Perry & More 1969 |
| Cladonia robbinsii A. Evans | Brodo et al. 2001 |
| Cladonia santensis Tuck. | Lendemer & Yahr 2004 |
| Cladonia sobolescens Nyl. ex Vainio | SCAN 1997 |
| Cladonia squamosa Hoffm. | Oosting & Anderson 1937 |
| Cladonia stellaris (Opiz) Pouzar & Vzda (Syn.: Cladonia alpestris) | Oosting & Anderson 1937 |
| Cladonia strepsilis (Ach.) Grognot | Oosting & Anderson 1937 |
| Cladonia stygia (Fr.) Ruoss (Syn.: Cladina stygia) | Ahti & Hyvonen 1985 |
| Cladonia subcariosa Nyl. (Syn.: Cladonia clavulifera, C. polycarpia) | Oosting & Anderson 1937 |
| Cladonia submitis A. Evans (Syn.: Cladina submitis) | Dey 1978 |
| Cladonia subradiata (Vainio) Sandst. | Brodo et al. 2001 |
| Cladonia subsetacea Robbins ex A. Evans | Lendemer & Yahr 2004 |
| Cladonia subtenuis (Abbayes) Mattick (Syn.: Cladina subtenuis) | Robinson 1959 |
| Cladonia turgida Hoffm. | Heiman 1996 |
| Cladonia uncialis (L.) F. H. Wigg. | Keever et al. 1951 |
| Coccocarpia erythroxyli (Sprengel) Swinscow & Krog | Brodo et al. 2001 |
| Coccocarpia palmicola (Sprengel) Arv. & D. J. Galloway (Syn.: Coccocarpia cronia) | Perry & Moore 1969 |
| Coenogonium luteum (Dicks.) Kalb & Lücking (Syn.: Dimerella lutea) | Brodo et al. 2001 |
| Collema callibotrys Tuck. | GBIF 2005 |
| Collema conglomeratum Hoffm. | Perry & Moore 1969 |
| Collema flaccidum (Ach.) Ach. | Dey 1978 |
| Collema furfuraceum (Arnold) Du Rietz | Dey 1978 |
| Collema nigrescens (Hudson) DC. | Dey 1978 |
| Collema pulcellum Ach. | Brodo et al. 2001 |
| Collema subflaccidum Degel. (Syn.: Collema subfervum) | Perry & Moore 1969 |

| Taxon | Reference |
|---|---|
| Conotrema urceolatum (Ach.) Tuck. | Brodo et al. 2001 |
| Cryptothecia rubrocincta (Ehrenb. : Fr.) Thor (Syn.: Herpothallon sanguineum) | Brodo 1994 |
| Dendriscocaulon intricatulum (Nyl.) Henssen | Brodo et al. 2001 |
| Dermatocarpon luridum (With.) J. R. Laundon (Syn.: Dermatocarpon fluviatile) | Heiman 1996 |
| Dermatocarpon miniatum (L.) W. Mann | Perry & Moore 1969 |
| Dibaeis absoluta (Tuck.) Kalb & Gierl (Syn.: Baeomyces absolutus) | Perry & Moore 1969 |
| Dibaeis baeomyces (L. F.) Rambold & Hertel (Syn.: Baeomyces fungoides, B. roseus) | Perry & Moore 1969 |
| Dimelaena oreina (Ach.) Norman | Brodo et al. 2001 |
| Diploschistes muscorum (Scop.) R. Sant. subsp. muscorum | Brodo et al. 2001 |
| Diploschistes scruposus (Schreber) Norman | Brodo et al. 2001 |
| Dirinaria aegialita (Afz.) B. Moore (Syn.: Dirinaria aspera) | Brodo et al. 2001 |
| Dirinaria confusa D. D. Awasthi | Brodo et al. 2001 |
| Dirinaria frostii (Tuck.) Hale & Culb. (Syn: Physcia frostii) | Perry & Moore 1969 |
| Dirinaria picta (Sw.) Clem. & Shear | Lendemer & Yahr 2004 |
| Dyplolabia afzelii (Ach.) A. Massal. (Syn.: Graphis afzelii) | Brodo et al. 2001 |
| Endocarpon pusillum Hedwig | Brodo et al. 2001 |
| Enterographa lecanoroides R. C. Harris (Syn.: Enterographa anguinella) | Lendemer & Yahr 2004 |
| Ephebe americana Henssen | Dey 1978 |
| Ephebe lanata (L.) Vainio | Brodo et al. 2001 |
| Ephebe solida Bornet | NatureServe 2005 |
| Epigloea pleiospora Döbbeler | Buck & Harris 2002 |
| Everniastrum catawbiense (Degel.) Hale ex Sipman (Syn.: Parmelia catawbiensis) | Dey 1978 |
| Fissurina columbina (Tuck.) Staiger | Lendemer & Yahr 2004 |
| Fissurina subnitidula (Nyl.) Staiger | Lendemer & Yahr 2004 |
| Flavoparmelia baltimorensis (Gyelnik & Fóriss) Hale | Dey 1978 |
| Flavoparmelia caperata (L.) Hale (Syn.: Parmelia caperata) | Perry & Moore 1969 |
| Flavopunctelia flaventior (Stirton) Hale (Syn.: | Dey 1978 |

| Taxon | Reference |
|---|---|
| Parmelia flaventior) | |
| Fuscidea recensa (Stirton) Hertel, V. Wirth & Vezda | Brodo et al. 2001 |
| Fuscopannaria leucophaea (Vahl) P. M. Jørg. (Syn.: Pannaria leucophaea) | McCune et al. 1997 |
| Fuscopannaria leucosticta (Tuck.) P. M. Jørg. (Syn.: Pannaria leucosticta) | Perry & Moore 1969 |
| Gassicurtia elizae (Tuck.) Marbach (Syn.: Buellia elizae) | Lendemer & Yahr 2004 |
| Glyphis cicatricosa Ach. | Brodo et al. 2001 |
| Gomphillus americanus Essl. | Buck 1998 |
| Graphina cypressi Müll. Arg. | Lendemer & Yahr 2004 |
| Graphina peplophora M. Wirth & Hale | Lendemer & Yahr 2004 |
| Graphis desquamescens (Fée) Zahlbr. | Lendemer & Yahr 2004 |
| Graphis illiterata R. C. Harris | Lendemer & Yahr 2004 |
| Graphis librata C. Knight | Lendemer & Yahr 2004 |
| Graphis lineola Ach. | Lendemer & Yahr 2004 |
| Graphis lucifica R. C. Harris | Lendemer & Yahr 2004 |
| Graphis scripta (L.) Ach. | SCAN 1996 |
| Graphis striatula (Ach.) Sprengel | Lendemer & Yahr 2004 |
| Gyrostomum scyphuliferum (Ach.) Nyl. | Lendemer & Yahr 2004 |
| Haematomma accolens (Stirton) Hillm. | Brodo et al. 2001 |
| Haematomma flexuosum Hillm. | Lendemer & Yahr 2004 |
| Haematomma persoonii (Fée) A. Massal. | Brodo et al. 2001 |
| Hafellia disciformis (Fr.) Marbach & H. Mayrhofer | USGS 2005 |
| Heppia adglutinata (Kremp.) A. Massal. | Lendemer & Yahr 2004 |
| Hertelidea pseudobotryosa R.C. Harris, Ladd & Printzen | Printzen & Kantvilas 2004 |
| Heterodermia albicans (Pers.) Swinscow & Krog | SCAN 1996 |
| Heterodermia appalachensis (Kurok.) Culb. | Culberson 1966 |
| Heterodermia caserettiana (A. Massal.) Trevisan | Perry & Moore 1969 |
| Heterodermia crocea R. C. Harris | Brodo et al. 2001 |
| Heterodermia echinata (Taylor) Culb. | Culberson 1966 |
| Heterodermia galactophylla (Tuck.) Culb. | Culberson 1966 |
| Heterodermia granulifera (Ach.) Culb. | Culberson 1966 |
| Heterodermia hypoleuca (Ach.) Trevisan | Perry & Moore 1969 |

| Taxon | Reference |
|---|---|
| Heterodermia leucomela (L.) Poelt | Perry & Moore 1969 |
| Heterodermia microphylla (Kurok.) Skorepa | McCune et al. 1997 |
| Heterodermia obscurata (Nyl.) Trevisan | Perry & Moore 1969 |
| Heterodermia propagulifera (Vainio) J. P. Dey | Dey 1978 |
| Heterodermia pseudospeciosa (Kurok.) Culb. | Culberson 1966 |
| Heterodermia speciosa (Wulfen) Trevisan (Syn.: Anaptychia speciosa, Heterodermia tremulans) | Culberson 1966 |
| Heterodermia squamulosa (Degel.) Culb. | Perry & Moore 1969 |
| Hydrothyria venosa J. L. Russell | Heiman 1996 |
| Hyperphyscia adglutinata (Flörke) H. Mayrh. & Poelt | Brodo et al. 2001 |
| Hyperphyscia syncolla (Tuck. ex Nyl.) Kalb | DePriest 2001 |
| Hypocenomyce anthracophila (Nyl.) P. James & Gotth. Schneider | Brodo et al. 2001 |
| Hypocenomyce scalaris (Ach.) M. Choisy | Brodo et al. 2001 |
| Hypogymnia enteromorpha (Ach.) Nyl. | Perry & Moore 1969 |
| Hypogymnia krogiae Ohlsson | Dey 1978 |
| Hypogymnia physodes (L.) Nyl. | Perry & Moore 1969 |
| Hypogymnia tubulosa (Schaerer) Hav. | Dey 1978 |
| Hypogymnia vittata (Ach.) Parrique | Dey 1978 |
| Hypotrachyna croceopustulata (Kurok.) Hale (Syn.: Parmelia croceopustulata) | Perry & Moore 1969 |
| Hypotrachyna densirhizinata (Kurok.) Hale (Syn.: Parmelia densirhizinata) | Dey 1978 |
| Hypotrachyna dentella (Hale & Kurok.) Hale (Syn.: Parmelia dentella) | Perry & Moore 1969 |
| Hypotrachyna gondylophora (Hale) Hale (Syn.: Parmelia gondylophora) | Dey 1978 |
| Hypotrachyna imbricatula (Zahlbr.) Hale (Syn.: Parmelia imbricatula) | Perry & Moore 1969 |
| Hypotrachyna laevigata (Sm.) Hale (Syn.: Parmelia laevigata) | Dey 1978 |
| Hypotrachyna livida (Taylor) Hale (Syn.: Parmelia livida) | Perry & Moore 1969 |
| Hypotrachyna oostingii (J. P. Dey) Hale (Syn.: Parmelia oostingii) | Dey 1978 |
| Hypotrachyna osseoalba (Vainio) Park & Hale (Syn.: Hypotrachyna formosana) | Heiman 1996 |
| Hypotrachyna producta Hale (Syn.: Parmelia | Dey 1978 |

| Taxon | Reference |
|---|---|
| producta) | |
| Hypotrachyna prolongata (Kurok.) Hale (Syn.: Parmelia rachista) | Dey 1978 |
| Hypotrachyna pseudosinuosa (Asah.) Hale | McCune et al. 1997 |
| Hypotrachyna pustulifera (Hale) Skorepa | McCune et al. 1997 |
| Hypotrachyna revoluta (Flörke) Hale (Syn.: Parmelia revoluta) | Perry & Moore 1969 |
| Hypotrachyna rockii (Zahlbr.) Hale (Syn.: Parmelia rockii) | Perry & Moore 1969 |
| Hypotrachyna showmanii Hale | McCune et al. 1997 |
| Hypotrachyna sinuosa (Sm.) Hale (Syn.: Parmelia sinuosa) | Dey 1978 |
| Hypotrachyna thysanota (Kurok.) Hale (Syn.: Parmelia thysanota) | Dey 1978 |
| Hypotrachyna virginica (Hale) Hale (Syn.: Parmelia virginica) | Perry & Moore 1969 |
| Imschaugia aleurites (Ach.) S. F. Meyer (Syn.: Parmeliopsis aleurites) | Perry & Moore 1969 |
| Imschaugia placorodia (Ach.) S. F. Meyer (Syn.: Parmeliopsis placorida) | Perry & Moore 1969 |
| Ionapsis lacustris (With.) Lutzoni (Syn.: Lecanora lacustris) | Brodo et al. 2001 |
| Lasallia papulosa (Ach.) Llano (Syn.: Umbilicaria pusulata var. papulosa) | Oosting & Anderson 1937 |
| Lasallia pensylvanica (Hoffm.) Llano (Syn.: Umbilicaria pustulata) | Dey 1978 |
| Lasallia pustulata (L.) Mérat | Keever et al. 1951 |
| Lecanora allophana Nyl. | Brodo et al. 2001 |
| Lecanora caesiorubella Ach. subsp. caesiorubella | Brodo et al. 2001 |
| Lecanora caesiorubella subsp. glaucomodes (Nyl.) Imshaug & Brodo | Lendemer & Yahr 2004 |
| Lecanora caesiorubella subsp. prolifera (Fink) R. C. Harris | DePriest 2001 |
| Lecanora cenisia Ach. | Brodo et al. 2001 |
| Lecanora cinereofusca H. Magn. var. cinereofusca | Brodo et al. 2001 |
| Lecanora cinereofusca var. appalachensis Brodo | Brodo et al. 2001 |
| Lecanora cupressi Tuck. | Brodo et al. 2001 |
| Lecanora hybocarpa (Tuck.) Brodo | Brodo et al. 2001 |
| Lecnora louisianae B. de Lesd. | Lendemer & Yahr 2004 |

| **Taxon** | **Reference** |
|---|---|
| Lecanora minutella Nyl. | LaGreca & Lumbsch 2001 |
| Lecanora oreinoides (Körber) Hertel & Rambold | SCAN 1997 |
| Lecanora polytropa (Hoffm.) Rabenh. | Brodo et al. 2001 |
| Lecanora strobilina (Sprengel) Kieffer | Brodo et al. 2001 |
| Lecanora symmicta (Ach.) Ach. | Brodo et al. 2001 |
| Lecanora thysanophora Harris | Brodo et al. 2001 |
| Lecanora varia (Hoffm.) Ach. | SCAN 1997 |
| Lecidea tessellata Flörke | Brodo et al. 2001 |
| Leiorreuma sericeum (Eschw.) Staiger (Syn.: Pheographis sericea) | Lendemer & Yahr 2004 |
| Lepraria lobificans Nyl. (Syn.: Lepraria finkii) | Brodo et al. 2001 |
| Lepraria neglecta (Nyl.) Erichsen | Brodo et al. 2001 |
| Lepraria membranacea (Dickson) Vainio (Syn.: Amphiloma lanuginosa, Leproloma membranaceum) | SCAN 1997 |
| Leptogium austroamericanum (Malme) C. W. Dodge | Heiman 1996 |
| Leptogium azureum (Sw.) Mont. | Perry & Moore 1969 |
| Leptogium burnetiae C. W. Dodge | Dey 1978 |
| Leptogium chloromelum (Sw. ex Ach.) Nyl. | Perry & Moore 1969 |
| Leptogium corticola (Taylor) Tuck. | Perry & Moore 1969 |
| Leptogium cyanescens (Rabenh.) Körber | Perry & Moore 1969 |
| Leptogium dactylinum Tuck. | Lendemer & Yahr 2004 |
| Leptogium hirsutum Sierk | Perry & Moore 1969 |
| Leptogium laceroides (B. de Lesd.) P. M. Jørg. | Dey 1978 |
| Leptogium lichinoides (L.) Zahlbr. | Heiman 1996 |
| Leptogium milligranum Sierk | Perry & Moore 1969 |
| Leptogium phyllocarpum (Pers.) Mont. | Brodo et al. 2001 |
| Leptogium tenuissimum (Dickson) Körber | USGS 2005 |
| Leptogium teretiusculum (Wallr.) Arnold | McCune et al. 1997 |
| Lichenodiplis lecanorae (Vouaux) Dyko & D. Hawksw. (Lichenocolous fungus, on Pertusaria) | Lendemer & Yahr 2004 |
| Lobaria pulmonaria (L.) Hoffm. | Perry & Moore 1969 |
| Lobaria quercizans Michaux | Perry & Moore 1969 |
| Lobaria ravenelii (Tuck.) Yoshim. | McCune et al. 1997 |

| Taxon | Reference |
|---|---|
| Lobaria scrobiculata (Scop.) DC. | Perry & Moore 1969 |
| Loxospora pustulata (Brodo & Culb.) R. C. Harris (Syn.: Haematomma pustulatum) | Brodo & Culberson 1986 |
| Loxospora ochrophaea (Tuck.) R. C. Harris | Brodo et al. 2001 |
| Maronea constans (Nyl.) Hepp | SCAN 1998 |
| Maronea polyphaea H. Magn. | Lendemer & Yahr 2004 |
| Megalaria laureri (Th. Fr.) Hafellner | Brodo et al. 2001 |
| Megalospora tuberculosa (Fée) Sipman | USGS 2005 |
| Melanelia culbersonii (Hale) Thell (Syn.: Cetraria culbersonii) | Heiman 1996 |
| Melanelia hepatizon (Ach.) Thell (Syn.: Cetraria hepatizon) | Dey 1978 |
| Melanelia exasperata (De Not.) Essl. | Heiman 1996 |
| Melanelia fuliginosa (Fr. ex Duby) Essl. | Brodo et al. 2001 |
| Melanelia halei (Ahti) Essl. (Syn.: Parmelia halei) | Perry & Moore 1969 |
| Melanelia stygia (L.) Essl. (Syn.: Parmelia stygia) | Perry & Moore 1969 |
| Melanelia subaurifera (Nyl.) Essl. (Syn.: Parmelia subaurifera) | Dey 1978 |
| Menegazzia terebrata (Hoffm.) A. Massal. | Perry & Moore 1969 |
| Micarea neostipitata Coppins & P. May | Coppins & May 2001 |
| Micarea peliocarpa (Anzi) Coppins & R. Sant. | Brodo et al. 2001 |
| Micarea prasina Fr. | Lendemer & Yahr 2004 |
| Mycocalicium subtile (Pers.) Szatala (Saprophytic fungus related to lichens or lichenicolous fungi) | Lendemer & Yahr 2004 |
| Myelochroa aurulenta (Tuck.) Elix & Hale (Syn.: Parmelia aurulenta, Parmelina aurulenta) | Perry & Moore 1969 |
| Myelochroa galbina (Ach.) Elix & Hale (Syn.: Parmelia galbina, Parmelina galbina) | Perry & Moore 1969 |
| Myelochroa obsessa (Ach.) Elix & Hale (Syn.: Parmelina obsessa) | Heiman 1996 |
| Myxobilimbia sabuletorum (Schreber) Hafellner (Syn.: Bacidia sabuletorum, Mycobilimbia sabuletorum) | Brodo et al. 2001 |
| Myriotrema glaucescens (Nyl.) Hale | Lendemer & Yahr 2004 |
| Myriotrema wightii (Taylor) Hale (Syn.: Thelotrema ravenelii) | Lendemer & Yahr 2004 |
| Nadvornikia sorediata R. C. Harris | Lendemer & Yahr 2004 |
| Nephroma helveticum Ach. subsp. helveticum | Perry & Moore 1969 |

| **Taxon** | **Reference** |
|---|---|
| Nephroma parile (Ach.) Ach. | Dey 1978 |
| Nephroma resupinatum (L.) Ach. | Dey 1978 |
| Normadina pulchella (Borrer) Nyl. | Dey 1978 |
| Ocellularia praestans (Müll. Arg.) Hale | Lendemer & Yahr 2004 |
| Ochrolechia africana Vainio | Brodo et al. 2001 |
| Ochrolechia pseudopallescens Brodo | Brodo 1991 |
| Ochrolechia trochophora (Vainio) Oshio var. trochophora | Brodo et al. 2001 |
| Ochrolechia yasudae Vainio | Brodo et al. 2001 |
| Opegrapha varia Pers. | Brodo et al. 2001 |
| Opegrapha viridis (Pers. ex Ach.) Behlen & Desberger | Lendemer & Yahr 2004 |
| Pannaria conoplea (Ach.) Bory (Syn.: Pannaria pityrea) | Dey 1978 |
| Pannaria lurida (Mont.) Nyl. ssp. lurida | Brodo et al. 2001 |
| Pannaria rubiginosa (Ach.) Bory | Perry & Moore 1969 |
| Pannaria tavarisii P. M. Jørg. | Heiman 1996 |
| Parmelia omphalodes (L.) Ach. subsp. omphalodes | Perry & Moore 1969 |
| Parmelia saxatilis (L.) Ach. | Perry & Moore 1969 |
| Parmelia squarrosa Hale | Dey 1978 |
| Parmelia sulcata Taylor | Perry & Moore 1969 |
| Parmeliella appalachensis P. M. Jørg. | Jørgensen 2000 |
| Parmeliella corallinoides (Hoffm.) Zahlbr. | Perry & Moore 1969 |
| Parmeliella pannosa (Sw.) Nyl. | Heiman 1996 |
| Parmeliella triptophylla (Ach.) Müll. Arg. | McCune et al. 1997 |
| Parmelinopsis horrescens (Taylor) Elix & Hale (Syn.: Parmelia horrescens, Parmelina horrescens) | Perry & Moore 1969 |
| Parmelinopsis minarum (Vainio) Elix & Hale (Syn.: Parmelia dissecta, Parmelina minarum) | Perry & Moore 1969 |
| Parmelinopsis spumosa (Asah.) Elix & Hale | McCune et al. 1997 |
| Parmeliopsis subambigua Gyelnik | Brodo et al. 2001 |
| Parmotrema arnoldii (Du Rietz) Hale | Dey 1978 |
| Parmotrema austrosinense (Zahlbr.) Hale | Heiman 1996 |
| Parmotrema chinense (Osbeck) Hale & Ahti (Syn.: Parmelia perlata) | Perry & Moore 1969 |
| Parmotrema crinitum (Ach.) M. Choisy (Syn.: Parmelia crinita) | Perry & Moore 1969 |

| Taxon | Reference |
|---|---|
| Parmotrema dilatatum (Vainio) Hale | McCune et al. 1997 |
| Parmotrema dominicanum (Vainio) Hale | USGS 2005 |
| Parmotrema eurysacum (Hue) Hale | McCune et al. 1997 |
| Parmotrema hypoleucinum (Steiner) Hale | Lendemer & Yahr 2004 |
| Parmotrema hypotropum (Nyl.) Hale (Syn.: Parmelia hypotropa) | Perry & Moore 1969 |
| Parmotrema madagascariaceum (Hue) Hale | Lendemer & Yahr 2004 |
| Parmotrema margaritatum (Hue) Hale (Syn.: Parmelia margaritata) | Perry & Moore 1969 |
| Parmotrema mellissii (C. W. Dodge) Hale (Syn.: Parmelia mellissii) | Dey 1978 |
| Parmotrema perforatum (Jacq.) A. Massal. (Syn.: Parmelia perforata) | Perry & Moore 1969 |
| Parmotrema praesorediosum (Nyl.) Hale | McCune et al. 1997 |
| Parmotrema rampoddense (Nyl.) Hale | Brodo et al. 2001 |
| Parmotrema rigidum (Lynge) Hale | McCune et al. 1997 |
| Parmotrema stuppeum (Taylor) Hale (Syn.: Parmelia stuppea) | Perry & Moore 1969 |
| Parmotrema submarginale (Michx.) DePriest & B. Hale (Syn.: Parmotrema michauxiana) | Perry & Moore 1969 |
| Parmotrema tinctorum (Delise ex Nyl.) Hale | DePriest 2001 |
| Parmotrema ultralucens (Krog) Hale | Heiman 1996 |
| Parmotrema xanthinum (Müll. Arg.) Hale (Syn.: Parmelia xanthina) | Perry & Moore 1969 |
| Peccania kansana (Tuck.) Forss. | Keever et al. 1951 |
| Peltigera canina (L.) Willd. | Perry & Moore 1969 |
| Peltigera didactyla (With.) J. R. Laundon | Brodo et al. 2001 |
| Peltigera elisabethae Gyelnik (Syn.: Peltigera horizontalis) | Dey 1978 |
| Peltigera lepidophora (Vainio) Bitter | Brodo et al. 2001 |
| Peltigera leucophlebia (Nyl.) Gyelnik | Heiman 1996 |
| Peltigera malacea (Ach.) Funck | Heiman 1996 |
| Peltigera neckeri Hepp ex Müll. Arg. | Brodo et al. 2001 |
| Peltigera phyllidiosa Goffinet & Miadlikowska | Goffinet & Miadlikowska 1999 |
| Peltigera polydactylon (Necker) Hoffm. | Perry & Moore 1969 |
| Peltigera praetextata (Flörke ex Sommerf.) Zopf | Brodo et al. 2001 |

| Taxon | Reference |
|---|---|
| Peltigera rufescens (Weiss) Humb. | Oosting & Anderson 1937 |
| Peltula cylindrica Wetmore | Brodo et al. 2001 |
| Peltula zahlbruckneri (Hasse) Wetmore | Wetmore 1970 |
| Pertusaria amara (Ach.) Nyl. | Brodo et al. 2001 |
| Pertusaria copiosa Erichsen | Lendemer & Yahr 2004 |
| Pertusaria epixantha R. C. Harris | Lendemer & Yahr 2004 |
| Pertusaria globularis (Ach.) Tuck. | Perlmutter (in review) |
| Pertusaria hypothamnolica Dibben | Lendemer & Yahr 2004 |
| Pertusaria iners R. C. Harris | Lendemer & Yahr 2004 |
| Pertusaria leioplaca DC. (Syn.: Pertusaria leucostoma) | DePriest 2001 |
| Pertusaria macounii (Lamb) Dibben | Brodo et al. 2001 |
| Pertusaria neoscotica Lamb | Lendemer & Yahr 2004 |
| Pertusaria obruta R. C. Harris | Lendemer & Yahr 2004 |
| Pertusaria ostiolata Dibben | SCAN 1996 |
| Pertusaria paratuberculifera Dibben | Brodo et al. 2001 |
| Pertusaria plittiana Erichsen | Brodo et al. 2001 |
| Pertusaria propinqua Müll. Arg. | GBIF 2005 |
| Pertusaria pustulata (Ach.) Duby | DePriest 2001 |
| Pertusaria rubefacta Erichsen | GBIF 2005 |
| Pertusaria subpertusa Brodo | Brodo et al. 2001 |
| Pertusaria texana Müll. Arg. | SCAN 1998 |
| Pertusaria trachythallina Erichsen | Brodo et al. 2001 |
| Pertusaria velata (Turner) Nyl. | Brodo et al. 2001 |
| Pertusaria xanthodes Müll. Arg. | SCAN 1997 |
| Phaeographis dendritica (Ach.) Müll. Arg. | Lendemer & Yahr 2004 |
| Phaeographis inusta (Ach.) Müll. Arg. | Brodo et al. 2001 |
| Phaeographis lobata (Eschw.) Müll. Arg. | Lendemer & Yahr 2004 |
| Phaeographis subtigrina (Vainio) Zahlbr. | Lendemer & Yahr 2004 |
| Phaeophyscia adiastola (Essl.) Essl. | Hieman 1996 |
| Phaeophyscia cernohorskyi (Nádv.) Essl. | Brodo et al. 2001 |
| Phaeophyscia ciliata (Hoffm.) Moberg (Syn.: Physcia ciliata) | Dey 1978 |
| Phaeophyscia erythrocardia (Tuck.) Essl. | Heiman 1996 |

| **Taxon** | **Reference** |
|---|---|
| Phaeophyscia hispidula (Ach.) Essl. (Syn.: Phaeophyscia imbricata, Physcia setosa) | Perry & Moore 1969 |
| Phaeophyscia orbicularis (Necker) Moberg (Syn.: Physcia orbicularis) | Perry & Moore 1969 |
| Phaeophyscia pusilloides (Zahlbr.) Essl. (Syn.: Physcia pusilloides) | Heiman 1996 |
| Phaeophyscia rubropulchra (Degel.) Essl. | Heiman 1996 |
| Phaeophyscia squarrosa Kashiwadani (Moberg 1995) (Syn.: Physcia lacinulata) | Perry & Moore 1969 |
| Phlyctis argena (Sprengel) Flotow | Brodo et al. 2001 |
| Phlyctis ludoviciensis (Müll. Arg.) Lendemer | Lendemer 2005 |
| Phyllospora confusa Swinscow & Krog | Lendemer & Yahr 2004 |
| Phyllospora parvifolia (Pers.) Müll Arg. var. parvifolia | Lendemer & Yahr 2004 |
| Physcia adscendens (Fr.) H. Olivier | Hieman 1996 |
| Physcia aipolia (Ehrh. ex Humb.) Fürnr. var. aipolia | Perry & Moore 1969 |
| Physcia americana G. Merr. (Syn.: Physcia tribacoides) | Perry & Moore 1969 |
| Physcia atrostriata Moberg (Syn.: Physcia albicans) | Brodo et al. 2001 |
| Physcia halei J. W. Thomson | Brodo et al. 2001 |
| Physcia millegrana Degel. | Heiman 1996 |
| Physcia neogaea R. C. Harris | McCune et al. 1997 |
| Physcia phaea (Tuck.) J. W. Thomson | Dey 1978 |
| Physcia pseudospeciosa J. W. Thomson | Heiman 1996 |
| Physcia pumilior R. C. Harris | Brodo et al. 2001 |
| Physcia sorediosa (Vainio) Lynge | Brodo et al. 2001 |
| Physcia stellaris (L.) Nyl. | Perry & Moore 1969 |
| Physcia subtilis Degel. | Perry & Moore 1969 |
| Physcia tribacia (Ach.) Nyl. | Oosting & Anderson 1937 |
| Physcia wainioi Räsänen | Perry & Moore 1969 |
| Physciella chloantha (Ach.) Essl. | Brodo et al. 2001 |
| Physconia detersa (Nyl.) Poelt | Heiman 1996 |
| Piccolia conspersa (Fée) Vainio | Lendemer & Yahr 2004 |
| Placidium lachneum (Ach.) Breuss | USGS 2005 |
| Placidium lacinulatum (Ach.) Breuss | Brodo et al. 2001 |

| Taxon | Reference |
|---|---|
| Placidium tuckermanii (Ravenel ex Mont.) Breuss (Syn.: Dermatocarpon arboreum, D. tuckermanii) | Perry & Moore 1969 |
| Placynthiella icmalea (Ach.) Coppins & P. James | Lendemer & Yahr 2004 |
| Placynthiella uliginosa (Schrader) Coppins & P. James | Lendemer & Yahr 2004 |
| Placynthium nigrum (Hudson) Gray | Brodo et al. 2001 |
| Platismatia glauca (L.) Culb. & C. Culb. | Perry & Moore 1969 |
| Platismatia tuckermanii (Oakes) Culb. & C. Culb. | Perry & Moore 1969 |
| Porina heterospora (Fink) R. C. Harris | Brodo et al. 2001 |
| Porina scabrida R. C. Harris | Lendemer & Yahr 2004 |
| Porpidia albocaerulescens (Wulfen) Hertel & Knoph (Syn.: Lecidea albocaerulescens) | Brodo et al. 2001 |
| Porpidia cinereoatra (Ach.) Hertel & Knoph | NatureServe 2005 |
| Porpidia crustulata (Ach.) Hertel & Knoph | Brodo et al. 2001 |
| Porpidia diversa (Lowe) Gowan | NatureServe 2005 |
| Porpidia herteliana Gowan | NatureServe 2005 |
| Porpidia macrocarpa (DC.) Hertel & A. J. Schwab | NatureServe 2005 |
| Porpidia tahawasiana Gowan | NatureServe 2005 |
| Porpidia tuberculosa (Sm.) Hertel & Knoph | NatureServe 2005 |
| Pseudevernia cladonia (Tuck.) Hale & Culb. | Perry & Moore 1969 |
| Pseudevernia consocians (Vainio) Hale & Culb. | Perry & Moore 1969 |
| Pseudocyphellaria aurata (Ach.) Vainio | Perry & Moore 1969 |
| Pseudocyphellaria crocata (L.) Vainio | Perry & Moore 1969 |
| Pseudoparmelia uleana (Müll. Arg.) Elix & Nash | Lendemer & Yahr 2004 |
| Psorula rufonigra (Tuck.) Gotth. Schneider | Brodo et al. 2001 |
| Punctelia appalachensis (Culb.) Krog (Syn.: Parmelia appalachensis) | Perry & Moore 1969 |
| Punctelia bolliana (Müll. Arg.) Krog | Hieman 1996 |
| Punctelia graminicola (B. de Lesd.) Egan (Syn.: Punctelia semansiana) | McCune et al. 1997 |
| Punctelia missouriensis G. Wilh. & Ladd | McCune et al. 1997 |
| Punctelia reddenda (Stirton) Krog (Syn.: Parmelia reddenda) | Dey 1978 |
| Punctelia rudecta (Ach.) Krog (Syn.: Parmelia rudecta) | Perry & Moore 1969 |
| Punctelia subrudecta (Nyl.) Krog (Syn.: Parmelia subrudecta) | Perry & Moore 1969 |

| Taxon | Reference |
|---|---|
| Pycnothelia papillaria Dufour (Syn.: Cladonia papillaria) | Robinson 1959 |
| Pyrenula anomala (Ach.) Vainio | Lendemer & Yahr 2004 |
| Pyrenula aspistea (Ach.) Ach. | Lendemer & Yahr 2004 |
| Pyrenula caryae R. C. Harris | Harris 1995 |
| Pyrenula citriformis R. C. Harris | Lendemer & Yahr 2004 |
| Pyrenula concatervans (Nyl.) R. C. Harris | Lendemer & Yahr 2004 |
| Pyrenula cruenta (Mont.) Vainio | Brodo et al. 2001 |
| Pyrenula leucostoma Ach. | Lendemer & Yahr 2004 |
| Pyrenula micheneri R. C. Harris | NatureServe 2005 |
| Pyrenula microcarpa Müll. Arg. | Lendemer & Yahr 2004 |
| Pyrenula psuedobufonia (Rehm) R. C. Harris | Brodo et al. 2001 |
| Pyrenula ravenelii (Tuck.) R. C. Harris | Lendemer & Yahr 2004 |
| Pyrenula santensis (Nyl.) Müll. Arg. | Lendemer & Yahr 2004 |
| Pyrrhospora russula (Ach.) Hafellner | Brodo et al. 2001 |
| Pyrrhospora varians (Ach.) R. C. Harris | DePriest 2001 |
| Pyxine caesiopruinosa (Nyl.) Imshaug | Heiman 1996 |
| Pyxine sorediata (Ach.) Mont. | Perry & Moore 1969 |
| Pyxine subcinerea Stirton | Lendemer & Yahr 2004 |
| Ramalina americana Hale (Syn.: Ramalina fastigiata) | Perry & Moore 1969 |
| Ramalina complanata (Sw.) Ach. | Lendemer & Yahr 2004 |
| Ramalina culbersoniorum La Greca | DePriest 2001 |
| Ramalina intermedia (Delise ex Nyl.) Nyl. | Perry & Moore 1969 |
| Ramalina montagnei De Not. | USGS 2005 |
| Ramalina paludosa B. Moore | Brodo et al. 2001 |
| Ramalina pollinaria (Westr.) Ach. | Perry & Moore 1969 |
| Ramalina stenospora Müll. Arg. | Lendemer & Yahr 2004 |
| Ramalina willeyi R. Howe | Brodo et al. 2001 |
| Ramonia microspora Vezda | Lendemer & Yahr 2004 |
| Rhizocarpon geographicum (L.) DC. | Brodo et al. 2001 |
| Rhizocarpon hochstetteri (Körber) Vainio | Brodo et al. 2001 |
| Rhizocarpon obscuratum (Ach.) A. Massal. | Brodo et al. 2001 |
| Rimelia cetrata (Ach.) Hale & Fletcher (Syn.: Parmelia cetrata, Parmotrema cetratum) | Perry & Moore 1969 |

| **Taxon** | **Reference** |
|---|---|
| Rimelia diffractaica (Essl.) Hale & Fletcher | McCune et al. 1997 |
| Rimelia reticulata (Taylor) Hale & Fletcher (Syn.: Parmelia reticulata, Parmotrema reticulatum) | Perry & Moore 1969 |
| Rimelia simulans (Hale) Hale & Fletcher | McCune et al. 1997 |
| Rimelia subisidiosa (Müll. Arg.) Hale & Fletcher (Syn.: Parmelia subisidiosa, Parmotrema subisidiosum) | Perry & Moore 1969 |
| Rinodina applanata H. Magn. (Syn.: Rinodina maculans) | Lendemer & Yahr 2004 |
| Rinodina ascociscana Tuck. | Brodo et al. 2001 |
| Sarcographa tricosa (Ach.) Müll. Arg. | Lendemer & Yahr 2004 |
| Schismatomma glaucescens (Nyl. ex Willey) R. C. Harris | Lendemer & Yahr 2004 |
| Scoliosporum chlorococcum (Stenh.) Vezda | Brodo et al. 2001 |
| Scoliosporum umbrinum (Ach.) Arnold | USGS 2005 |
| Sphinctrina anglica Nyl. | USGS 2005 |
| Sphinctrina tubiformis A. Massal. | Lendemer & Yahr 2004 |
| Staurolemma carolinianum Jørg. | Jørgensen 2004 |
| Staurothele diffractella (Nyl.) Tuck. | Keever et al. 1951 |
| Steinia geophana (Nyl.) Stein | Buck et al. 1999 |
| Stereocaulon dactylophyllum Flörke | Perry & Moore 1969 |
| Stereocaulon dactylophyllum var. occidentale (H. Magn.) Lamb | NatureServe 2005 |
| Stereocaulon paschale (L.) Hoffm. | Heiman 1996 |
| Stereocaulon pileatum Ach. | Perry & Moore 1969 |
| Stereocaulon saxatile H. Magn. | Heiman 1996 |
| Stereocaulon tennesseense H. Magn. ex Degel. | Dey 1978 |
| Sticta beauvoisii Delise | Brodo et al. 2001 |
| Sticta carolinensis McDonald | McDonald et al. 2003 |
| Sticta fragilanata McDonald | McDonald et al. 2003 |
| Sticta fuliginosa (Hoffm.) Ach. | Perry & Moore 1969 |
| Sticta limbata (Sm.) Ach. | Dey 1978 |
| Teloschistes chrysophthalmus (L.) Th. Fr. | Brodo et al. 2001 |
| Teloschistes flavicans (Sw.) Norman | NatureServe 2005 |
| Tephromela atra (Hudson) Hafellner | Brodo et al. 2001 |
| Thelotrema adjectum Nyl. | Lendemer & Yahr 2004 |

| Taxon | Reference |
|---|---|
| Thelotrema defectum Hale | Lendemer & Yahr 2004 |
| Thelotrema lathraeum Tuck. | Lendemer & Yahr 2004 |
| Thelotrema monospermum R. C. Harris | USGS 2005 |
| Thelotrema subtile Tuck. | Lendemer & Yahr 2004 |
| Topelia aperiens P. M. Jørg. & Vezda | Lendemer & Yahr 2004 |
| Trapelia involuta (Taylor) Hertel | Brodo et al. 2001 |
| Trapeliopsis flexuosa (Fr.) Coppins & P. James | Brodo et al. 2001 |
| Trapeliopsis granulosa (Hoffm.) Lumbsch | Brodo et al. 2001 |
| Tremolecia atrata (Ach.) Hertel | Brodo et al. 2001 |
| Trichothelium cestrense (Michener) R. C. Harris | Lendemer & Yahr 2004 |
| Trichothelium rhaphidospermum (Müll. Arg.) R. C. Harris | Lendemer & Yahr 2004 |
| Trypethelium tropicum (Ach.) Müll. Arg. | Lendemer & Yahr 2004 |
| Trypethelium virens Tuck. ex Michener | Brodo et al. 2001 |
| Tuckermanella fendleri (Nyl.) Essl. (Syn.: Cetraria fendleri, Tuckermannopsis fendleri) | Perry & Moore 1969 |
| Tuckermannopsis americana (Sprengel) Hale (Syn.: Cetraria halei) | Perry & Moore 1969 |
| Tuckermannopsis ciliaris (Ach.) Gyelnik (Syn.: Cetraria ciliaris) | Perry & Moore 1969 |
| Tuckermannopsis orbata (Nyl.) M. J. Lai (Syn.: Cetraria orbata) | Perry & Moore 1969 |
| Umbilicaria caroliniana Tuck. | Perry & Moore 1969 |
| Umbilicaria mammulata (Ach.) Tuck. | Perry & Moore 1969 |
| Umbilicaria muhlenbergii (Ach.) Tuck. (Syn.: Actinogyra muhlenbergii) | Perry & Moore 1969 |
| Umbilicaria polyphylla (L.) Baumg. | Heiman 1996 |
| Umbilicaria vellea (L.) Hoffm. | Heiman 1996 |
| Usnea amblyoclada (Müll. Arg.) Zahlbr. | Brodo et al. 2001 |
| Usnea angulata Ach. | Perry & Moore 1969 |
| Usnea baileyi (Stirton) Zahlbr. | Lendemer & Yahr 2004 |
| Usnea ceratina Ach. | Dey 1978 |
| Usnea confusa Asah. | Dey 1978 |
| Usnea cornuta Körber | McCune et al. 1997 |
| Usnea dasaea Stirton | McCune et al. 1997 |
| Usnea diplotypus Vainio | Dey 1978 |

| **Taxon** | **Reference** |
|---|---|
| Usnea evansii Mot. | Lendemer & Yahr 2004 |
| Usnea filipendula Stirton | Brodo et al. 2001 |
| Usnea fragilescens var. mollis (Vainio) Clerc (Syn.: Usnea mollis) | Dey 1978 |
| Usnea fulvoreagens (Räsänen) Räsänen | Dey 1978 |
| Usnea hesperina Mot. | Dey 1978 |
| Usnea merrillii Mot. | Perry & Moore 1969 |
| Usnea mutabilis Stirton | Hieman 1996 |
| Usnea occidentalis Mot. | Perry & Moore 1969 |
| Usnea pachyclada Mot. | Perry & Moore 1969 |
| Usnea pensylvanica Mot. | Lendemer & Yahr 2004 |
| Usnea rubicunda Stirton | Perry & Moore 1969 |
| Usnea strigosa (Ach.) Eaton subsp. strigosa | Perry & Moore 1969 |
| Usnea strigosa subsp. rubiginea (Michaux) I. Tav. | USGS 2005 |
| Usnea subfloridana Stirton | Dey 1978 |
| Usnea subfusca Stirton | Dey 1978 |
| Usnea subscabrosa Nyl. ex Mot. | Perry & Moore 1969 |
| Usnea trichodea Ach. | Perry & Moore 1969 |
| Vainionora americana Kalb, Tonsberg & Elix | Kalb 2004 |
| Verrucaria calciseda DC. | Lendemer & Yahr 2004 |
| Verrucaria nigrescens Pers. | Oosting & Anderson 1939 |
| Vezdaea leprosa (P. James) Vezda | Buck et al. 1999 |
| Vulpicida pinastri (Scop.) J.-E. Mattsson & M. J. Lai (Syn.: Tuckermannopsis pinastri) | Hieman 1996 |
| Vulpicida viridis (Schwein.) J.-E. Mattsson & M. J. Lai (Syn.: Cetraria viridis, Tuckermannopsis viridis) | Perry & Moore 1969 |
| Xanthomendoza fulva (Hoffm.) Søchting, Kärnefelt & S. Kondr. (Syn.: Xanthoria fulva) | Brodo et al. 2001 |
| Xanthoparmelia conspersa (Ehrh. ex Ach.) Hale (Syn.: Parmelia conspersa) | Oosting & Anderson 1937 |
| Xanthoparmelia cumberlandia (Gyelnik) Hale | Dey 1978 |
| Xanthoparmelia monticola (J. P. Dey) Hale (Syn.: Parmelia monticola) | Dey 1978 |
| Xanthoparmelia piedmontensis (Hale) Hale | Heiman 1996 |
| Xanthoparmelia plittii (Gyelnk) Hale (Syn.: | Perry & Moore 1969 |

| **Taxon** | **Reference** |
|---|---|
| Parmelia plittii) | |
| Xanthoparmelia somloënsis (Gyelnik) Hale | Brodo et al. 2001 |
| Xanthoparmelia subramegira (Gyelnik) Hale | Heiman 1996 |
| Xanthoparmelia tasmanica (Hook. f. & Taylor) Hale (Syn.: Parmelia tasmanica) | Perry & Moore 1969 |
| Xanthoria candelaria (L.) Th. Fr. | USGS 2005 |
| Xanthoria elegans (Link) Th. Fr. | Brodo et al. 2001 |
| Xanthoria polycarpa (Hoffm.) Rieber | Dey 1978 |
| Xanthoria sorediata (Vainio) Poelt | Heiman 1996 |
| Xylographa parallela (Ach. : Fr.) Behlen & Desberger | Brodo et al. 2001 |
| **Total** | **605** |

## References

Ahti T. and S. Hyvonen. 1985. Cladina stygia, a common, overlooked species of reindeer lichen. Annales Botanici Fennici 22: 223-229.

Brodo I.M. 1991. Studies on the lichen genus Ochrolechia. 2. Corticolous species of North America. Canadian Journal of Botany 69(4): 733-772.

---. 1994. "Herpothallon sanguineum" in Delaware: a reevaluation. Evansia 11(3): 87.

--- and W.L. Culberson. 1986. Heamatomma pustulatum, sp. nov. (Ascomycotina, Heamatommataceae): a common, widespread, sterile lichen from eastern North America. The Bryologist 89: 203-205.

---, Sharnoff S.D. and Sharnoff S. 2001. Lichens of North America. Yale University Press, New Haven, Conneticut.

Buck, W.R. 1998. Lichen flora of eastern North America: the genus Gomphillus (Gomphillaceae), pp. 71-76, In Lichenographia Thomsoniana: North American Lichenology in Honor of John W. Thomson, Mycotaxon Ltd., Ithaca, NY.

--- and R.C. Harris. 2002. Epigloea (Epigloeaceae) new to North America. Evansia 19(3): 83-84.

---, R.C. Harris, A.J. Shaw, M.D. Piercy-Normore, A. Tabaee, J. Antanovics, and E.E. Crone. 1999. Unusual lichens under electricity pylons on zinc-enriched soil. The Bryologist 102(1): 130-132.

Coppins, B.J. and P.F. May. 2001. Micarea neostipitata, a new species with pale stipitate pycnidia from eastern North America. Lichenologist 33: 487-490.

Culberson, W.L. 1966. Chemistry and taxonomy of the lichen genera Heterodermia and Anaptychia in the Carolinas. The Bryologist 69: 472-487.

---, C.F. Culberson and A. Johnson. 1982. A new endemic red-fruited Cladonia from the North Carolina coast. Mycologia 74:662-667.

DePriest, P.T. 2001. Lichen inventory for proposed Big Cove land exchange. Great Smoky Mountains National Park, North Carolina. SI DSG Code 686026.

Dey, J.P. 1973. Cladonia psoromica, a new lichen species from western North Carolina. The Bryologist 76: 418-421.

---. 1978. Fruticose and foliose lichens of the high-mountain areas of the southern Appalachians. Bryologist 81: 1-93.

---. 1987. The distribution of the lichen, Bulbothrix isidiza, in North America north of Mexico. The Bryologist 90(4): 417-418.

Esslinger, T.L. 1997. A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. North Dakota State University: http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.html (First Posted 1 December 1997, Most Recent Update 2 March 2004), Fargo, North Dakota.

Goffinet, B. and J. Miadlikowska. 1999. Peltigera phyllidiosa (Peltigeraceae, Ascomycota), a new species from the southern

Appalachians corroborated by ITS sequences. Lichenologist 31(3): 247-256.

Harris, R.C. 1995. More Florida Lichens, including the 10¢ tour of the pyrenolichens. Published by the author, Bronx, N.Y., 192 pp.

Hieman, K. 1996. Macrolichens of the Blue Ridge Parkway in North Carolina. Evansia 13(2): 47- 57.

--- and J.A. Elix. 1999. A new species of Canoparmelia from North America (lichenized Ascomycotina, Parmeliaceae). Mycotaxon 70: 163-166.

Jørgensen, P.M. 2000. Survey of the lichen family Pannariaceae on the American continent, north of Mexico. The Bryologist 103(4): 670-704.

---. 2004. A new North American species of the lichen genus Staurolemma (Collemataceae). The Bryologist 107(3): 392-394.

Keever, C., H.J. Oosting and L.E. Anderson. 1951. Plant succession on exposed granite of Rocky Face Mountain, Alexander County, North Carolina. Bull. Torrey Bot. Club 78(5): 401-421.

LaGreca, S. and H.T. Lumbsch. 2001. Three species of Lecanora new to North America, with notes on other poorly known lecanoroid lichens. The Bryologist 104 (2): 204–211.

Lendemer, J.C. 2005. Lichens of Eastern North America Exsiccati. Fascicle IV, no.s 151-200. Opuscula Philolichenum 2: 37-51.

--- and R. Yahr. 2004. A Checklist of the lichens collected during the Tuckerman Workshop #12, Outer Banks, North Carolina, USA.

McCune B., J. Dey, J. Peck, K. Heiman, and S. Will-Wolf. 1997. Regional gradients in lichen communities of the southeast United States. The Bryologist 100 (2): 145-158.

McDonald, T., J. Miadlikowska and F. Lutzoni. 2003. The lichen genus Sticta in the Great Smoky Mountains: a phylogenetic study of morphological, chemical and molecular data. The Bryologist 106(1): 61-79.

Mozingo, H.N. 1954. Two notable additions to the lichen flora of the Great Smoky Mountains National Park. The Bryologist 57(1): 31-32.

Oosting, H.J. and L.E. Anderson. 1937. The vegetation of a barefaced cliff in western North Carolina. Ecology 18(2): 280-292.

---. 1939. Plant succession on granite rock in eastern North Carolina. Botanical Gazatte 100: 750-768.

Perry, J.D. and B.J. Moore. 1969. Preliminary check list of foliose and fruticose lichens in Bucombe County, North Carolina. Castanea 34: 146-157.

Printzen, C. and T. Tønsberg. 2003. Four new species and three new apothecial pigments of Biatora. In Jensen, M. (ed.), Lichenological Contributions in Honor of G. B. Feige. Bibliotheca Lichenologica, J. Cramer, Berlin, Stuttgart, pp. 133-145.

--- and G. Kantlivas. 2004. Hertelidea, genus novum Stereocaulacearum (Ascomycetes lichenisati). In: Döbbeler, P. and G. Rambold (eds.): Contributions to lichenology. Festschrift in honor of Hans Hertel. Bibliotheca Lichenologica, J. Cramer in der Gerbrüder Borntraeger, Berlin, Stuttgart, pp. 539-553.

Robinson, H. 1959. Lichen succession in abandonded fields in the Piedmont of North Carolina. The Bryologist 62: 254-259.

South Carolina Association of Naturalists. 1996. Bigleaf Magnolia Site, Gaston County, NC flora/fauna list. http://www.scnaturalists.org/archive/may96.html

---. 1997. Paysour Mountain, Gaston County, NC flora/fauna list. http://www.scnaturalists.org/archive/fflists/nov97ff.html

---. 1998. Whitehall Nature Preserve, Mecklenberg County, NC flora/fauna list. http://www.scnaturalists.org/archive/fflists/mar98ff.html

U. S. Geological Survey. 2005. NPLichen, a database of lichens in the U.S. National Parks March 1, 2005 version. http://www.ies.wisc.edu/nplichen. Accessed April 20, 2005.

Wetmore C.M. 1970. The lichen family Heppiaceae in North America. Ann. Missouri Bot. Garden 57: 158-209.

--- and E.I. Kärnefelt. 1999. What is Caloplaca cinnabrina? The Bryologist 102(4): 683-691.

# The Bryophyte Flora of The Cranberry Bog Preserve, Suffolk County, NY, With Notes on their Distribution.

Eric C. Morgan[1] & Jon A. Sperling[2]

**Abstract** -- The Cranberry Bog Preserve (Riverhead, New York) is an approximately 165-acre site of a former commercial cranberry bog. The bryophyte flora of the preserve consists of forty nine species of moss (Class Musci), and twenty species of Liverwort (Class Hepaticae). Distribution information is provided for species by habitat in order to provide a baseline record for future comparison. Changes are anticipated as the bog and surrounding forest ages.

**Keywords** -- Long Island, Suffolk County, bryophyte flora, cranberry bog, bryophyte distribution

The Cranberry Bog Preserve, located in Suffolk County, Long Island, NY, is an approximately 165 acre, publicly owned site managed by the Suffolk County Department of Parks. The site is at the eastern edge of the area known as the Pine Barrens region of Long Island. This area is characterized by sandy, well drained soils, and a forest cover consisting mainly of Pitch Pine (*Pinus rigida* Miller.) and occasional oaks in the overstory, and a dense understory of Scrub Oak, (*Quercus ilicifolia* Wangenh.), blueberrys (*Vaccinium* spp. ), and numerous other ericaceous shrubs.

The Cranberry Bog Preserve site was developed as a commercial bog in 1885 and the first harvests from the site were taken in 1889. This site, called the Woodhull Bog after its founders, the Woodhull Brothers of Riverhead, became the largest of all the commercial bogs on Long Island, with 21,000 bushels harvested by 1892 (Turner 1994 pgs. 123-127). For a variety of economic reasons, the cranberry industry on Long Island declined thus resulting in sites such as this being converted into preserved public land. The demise of the commercial bog has also led to the end of the manual flooding and draining of the bog, resulting in a more consistant water level

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throughout the year. This change has surely had an impact on the flora of the area, and this report will provide a baseline by which future changes in the bryophyte flora can be measured.

**Materials and Methods** -- The site was sampled regularly over a period of more than two years from March 2001, through June 2003. In total, over 440 specimens were collected and identified over the course of the study. Voucher specimens have been taken for all species identified and deposited in the Herbarium of Queens College, Department of Biology, Flushing, NY. Nomenclature for Class Musci follows that of (Ketchledge 1980) and Hepaticae follows Schuster (1953) with updated nomenclature following the Bryophyte Flora of North America web site (BFNA 2004) for those families treated on the website. Identification in the field and lab was done using the keys provided by Andrus (1980), Crum (1983), Grout (1916), Conard and Redfearn (1979) and Schuster (1949,1953).

The Study site consisted of all areas within the Cranberry Bog Preserve, and several small patches of similar habitat bordering the preserve but totaling less than 3 acres. The site was divided into several categories dependent upon its higher vegetation.

| | |
|---|---|
| Category I | Pine Barrens: dry, sandy upland sites containing mainly *Pinus rigida* Miller. and *Quercus alba* L. |
| Category II | Red Maple - Sweet Pepperbush Wetland: wet area consisting of *Acer rubrum* L. overstory and an understory of mainly *Clethra alnifolia* L. |
| Category III | Atlantic White Cedar Swamp: dense stands of *Chamaecyparis thyoides* (L.) B.S.P., and little understory vegetation. |
| Category IV | Open Bog areas: *Sphagnum* dominated areas with occasional mixed herbaceous vegetation. Few woody plants. |
| Category V | Open wet areas: includes all stream and open pond areas. Usually dominated by *Spiraea tomentosa* L., *Decodon verticillatus* (L.) Elliott., and assorted monocots. |

Abundance of the Bryophytes was measured as follows.

| | |
|---|---|
| Rare (R) | Present at 1 - 5 Individual sites |
| Occasional (O) | Present at 5 – 20 Individual sites |
| Common (C) | Present at 20 + Individual sites |

Abundance was measured in a broad sense, only to help determine the importance of particular species in the Preserve and not as a definitive measurement of the Bryophyte community structure as a whole.

**Results** -- In total 49 species of mosses, class Musci, and 20 species of liverworts, class Hepaticae were found in the preserve. A total of sixty-nine individual species were found and are listed in Appendix 1.

The most species rich category was Category II, The Red Maple – Sweet Pepperbush wetland. The least species - rich of the areas was Category IV, the Open Bog areas. Results are summarized in Table 1. These results are in line with the authors' expectations although it should be noted that upon further examination, numerous additional species would likely be found in areas they are not listed for here. These categories are meant as a guide to where one will be most likely to find a particular species, and not as the only possible areas for location of particular taxa. Missing from the flora was *Lophozia capitata* (Hook.), previously reported from the Cranberry Bog site by Biechele (1993) where a Hepatic flora of seventy-three species for the eastern section of Suffolk County was reported however the geographic range of this study is a small fraction of the size of that area.

**Discussion** -- The availability of light through to the floor for much of the year in the *Acer* swamp allows a flourishing understory of *Carex stricta* Lam., *Onoclea sensibilis* L., and numerous other herbs playing a more minor role. Large tussocks of *C. stricta* also provide a small elevationally based moisture gradient upon which numerous species exist. The significant moisture at the base of the trees also allowed several *Sphagnum* species to thrive as well. Similar studies on the Red Maple Swamps of Long Island have shown these areas to be quite rich in species of bryophytes. At nearby site at Hauppauge Lake, 18 species of Liverwort and 34 species of moss were found (Cain 1936). The results reported here are in line with that earlier study including many of the same species found by Cain.

This Red Maple swamp flora is in stark contrast to the depauperate flora in the adjacent Atlantic Cedar swamp, in which only eight species of moss and eight species of liverwort were found and these were in small quantity. This is likely attributed to the high density of trees and persistence of fallen white cedar leaf matter on the very wet forest floor as compared to the Red Maple Swamp. The role of pH should also not be overlooked and will be discussed further in future studies.

The species richness of the Pine Barrens area likely can be attributed to its sheer size and variety of habitat due to variable moisture, soil and shade regimes. This area can likely be divided further into several habitat groups that are beyond the scope of the present study.

The Sphagnum dominated area and streams were species poor for several possible reasons. In the sphagnum bogs, *Sphagnum* is dominant, and its ability to float enable it to adjust to the changing water levels within the bog. The open wet areas present similar ecological challenges and the flowing water prevents sphagnum from taking hold as it has in still water areas. This accompanied with its small overall area account for the category's lack of species.

In general, few bryophyte floras have been done for the Long Island area, and almost none in recent years, exceptions being (Biechele 1993, Morgan & Sperling 2003, Sperling & Morgan 2003). This list provides a record of the bryophytes, as well as notes on their general distribution, for a very commonly visited preserve.

**Acknowledgement** -- The Authors would like to thank Dr. Andrew Greller, Professor Emeritus, Queens College, Flushing, NY for providing valuable suggestions on this manuscript. We would also like to thank the Suffolk County Department of Parks and Recreation for allowing access to the site.

## References

Andrus, R.E. 1980. Sphagnaceae (Peat Moss Family) of New York State. Contributions to a Flora of New York State. III. N.Y. State Museum Bull. No. 442.

Biechele, L.T. 1993. A checklist of the Hepaticae and Anthocerotae of Eastern Suffolk County, Long Island, New York. Evansia. 10:99-103.

BFNA. 2004. The Bryophyte Flora of North America web site. http://ridgwaydb.mobot.org/bfna/bfnamenu.htm (accessed 2003)

Cain, S., and W.T. Penfound. 1936. Aceretum rubri: The red maple swamp forest of central Long Island. The American Midland Naturalist. 19:390-416.

Conard, H.S. and P.L. Redfearn Jr. 1979. How to know the Mosses and Liverworts Second Edition. WCB McGraw Hill. Boston, Mass.

Crum, H. 1983. Mosses of the Great Lakes Forest. University of Michigan Herbarium. Ann Arbor, Michigan.

Grout, A.J. 1916. The Moss Flora of New York City and Vicinity. Published by Author. New Dorp, NY.

Ketchledge, E.H. 1980. Revised Checklist of the Mosses of New York State. Contributions to a Flora of New York State I. N.Y. State Museum Bull. No. 440.

Morgan, E.C. and J.A. Sperling. 2003. A survey of the Bryophytes of Shu Swamp Preserve, Mill Neck, New York. Long Island Botanical Society Newsletter 13: 25,27.

Schuster, R.M. 1949. The Ecology and Distribution of Hepaticae in Central and Western New York. The American Midland Naturalist. 42(3).

Schuster, R.M. 1953. Boreal Hepaticae. A Manual of the Liverworts of Minnesota and Adjacent Regions. The American Midland Naturalist. 49(2).

Sperling, J.A. and E.C. Morgan. 2003. The Bryophyte flora oc Cunningham Park and Alley Pond Park. A new flora from old specimens. Evansia. 20:11-14.

Turner, J.L. 1994. Exploring the other Island, A Seasonal Guide to Nature on Long Island. Waterline Books. Great Falls, Virginia. pp123-127.

## Appendix 1. (Morgan & Sperling)
## Mosses and Liverworts of the Cranberry Bog Preserve

Class Musci

*Anomodon attenuatus* (Hedw.) Hueb. O/I O/V
*Atrichum angustatum* (Brid.)B.S.G. O/I
*Atrichum crispum* (James)Sull. O/I C/II O/III C/V
*Aulacomnium palustre* (Hedw.)Schwaegr C/I C/II O/III O/IV
*B. oxycladon* (Brid.) Jaeg. & Sauerb. var oxycladon C/II O/III O/V
*Brachythecium acuminatum* (Hedw.) Aust. O/II
*Brotherella recurvans* (Michx.) Fleisch. O/II
*Bryhnia novae-angliae* (Sull. & Lesq. *ex* Sull.) Grout. O/V
*Bryum argenteum* Hedw C/I
*C. dendroides* (Hedw.) Web & Mohr. O/II
*Callicladium haldanianum* (Grev.) Crum. C/I C/II O/V
*Ceratodon purpureus* (Hedw.) Brid. C/I
*Climacium americanum* Brid. O/II
*Dicranella heteromalla* (Hedw.) Schimp. O/I
*Dicranum flagellare* Hedw. C/II
*Dicranum flagellare* Hedw. var. *minutissimum* Grout. C/II O/III
*Dicranum scoparium* Hedw. O/II O/III R/IV
*Dicranum undulatum* Brid. R/II
*Diphyscium foliosum* (Hedw.)Mohr. R/I
*Ditrichum pallidum* (Hedw.) Hampe. O/I
*Drepanocladus exannulatus* (B.S.G.) Warnst. O/II
*Funaria hygrometrica* Hedw. var *hygrometrica.* O/I
*Hygroamblystegium tenax* (Hedw.) Jenn. O/II O/V
*Hypnum curvifolium* Hedw. C/I O/II
*Hypnum imponens* Hedw. O/I
*Leptodictyum trichopodium* (Schultz) Warnst. O/II O/V
*Leucobryum glaucum* (Hedw.) Angstr. *ex* Fr. C/I R/II
*Mnium affine* Bland. O/II
*Mnium cuspidatum* C/II O/III O/V
*Mnium hornum* Hedw C/II
*Mnium punctatum* Hedw. var. punctatum O/II O/IV
*Philonotis fontana* (Hedw.) Brid. var. *fontana* O/II O/IV C/V
*Physcomitrium pyriforme* (Hedw.) Hampe. O/1
*Platygerium repens* (Brid.) B.S.G. O/I
*Polytrichum commune* Hedw. C/I Commonest Polytrichum
*Polytrichum juniperinum* Hedw. O/I
*Polytrichum piliferum* Hedw. C/I
*Sphagnum cuspidatum* Hoffm. O/IV
*Sphagnum fallax* (Klinggr.) Klinggr. C/II C/IV
*Sphagnum fimbriatum* Wils. O/IV
*Sphagnum magellanicum* Brid. C/IV
*Sphagnum palustre* L. O/II O/IV
*Sphagnum papillosum* Lindb. O/IV
*Sphagnum recurvum* P.Beauv. C/II O/III C/IV
*Sphagnum rubellum* Wils. O/IV

*Sphagnum torreyanum* Sull. R/V
*Tetraphis pellucida* Hedw. C/II O/III always mixed with other bryophytes
*Thelia hirtella* (Hedw.) Sull. C/I on tree bases up to .5m
*Thuidium delicatulum* (Hedw.)B.S.G. var. *delicatulum* C/I O/II

Class Hepaticae
*Bazzania trilobata* (L.) S.Gray. O/II
*Calypogeja fissa* L. Raddi. C/II O/III O/V
*Cephalozia bicuspidata* (L.) Dum. O/I O/II
*Cephalozia lunulifolia* (Dum.) Dum. C/II O/III
*Cephaloziella hampeana* (Nees.) Schiffn. R/II
*Cladopodiella fluitans* (Nees) Joerg. O/IV
*Fossombronia wondraczekii* (L.) Dum. R/II R/III
*Frullania asagrayana* Mont. O/I
*Frullania eboracensis* Gott. C/I Abundant up to 2m on White Oak Bark
*Jamesoniella autumnalis* (DC.) Steph. O/II O/IV
*Lophocolea heterophylla* (Schrad.) Dum. C/II C/III O/IV C/V
*Odontoschisma denudatum* (Nees *ex* Mart.) Dum.
*Odontoschisma prostratum* (Sw.) Trev. C/II O/V
*Pallavicinia lyellii* (Hook.) Carruth. C/II O/III O/IV O/V
*Pellia epiphylla* (L.) Corda. C/II O/III
*Riccardia palmata* (Hedw.) Carruth. R/II R/III
*Riccia fluitans* L. O/V
*Ricciocarpus natans* (L.) Corda R/V
*Scapania nemorosa* (L.) Dum. O/II R/V
*Telaranea nematodes* (Gott. *ex* Aust.) M.A.Howe O/II R/III

**Table 1.**
**Summary of the abundance of Bryophytes by Habitat**

| Category | I | II | III | IV | V |
|---|---|---|---|---|---|
| Mosses | 21 | 27 | 8 | 12 | 10 |
| Liverworts | 2 | 15 | 9 | 4 | 7 |
| **Total** | **23** | **42** | **17** | **16** | **17** |

# *Tortula papillosa* and *Tortula pagorum* (Pottiaceae) in New York State

Norm Trigoboff[1]

**Abstract** -- *Tortula papillosa,* formerly considered rare in New York, occurs at 80 sites. *Tortula pagorum,* formerly unknown in New York, occurs at 6 sites.

The moss, *Tortula papillosa* Wils. *in* Spruce, has a wide range in eastern North America. Clemants and Ketchledge (1990) list it as known from 5 or fewer sites in New York State. However, it is widespread, common and sometimes abundant here. Collections – most within the last year – exist from 17 counties: Broome (*Trigoboff c0598, c0599*, BH); Cattaraugus (*Eckel 192284n*, MO); Cayuga (*Trigoboff c0564, c0565, c0567*, BH); Cortland (*O'Rourke 1; Trigoboff c04162, c04162a, c04163, c04165, c0518, c0520, c0521, c0522, c0523, c0524, c0525, c0526, c0527, c0528, c0529, c0531, c0532, c0542, c0543, c0544, c0545, c0546, c0547, c0550, c0551, c0552, c0555, c0556, c0557, c0558, c0559, c0560, c0561, c0562, c0563, c0589*, BH; *c04164*, BH & NY; *c04162b, c04167, c04168*, BH, NY & NYS); Kings (*Brainerd s.n.*, NY); Monroe (*Martin 539*, NYS); Nassau (*Trigoboff c04175, c04178, c04179, c04180, c04182, c04183, c04186, c04187, c04188, c04189, c056, c059, c0510, c0512*, BH; *c0511*, BH & NYS); Onondaga (*Trigoboff c0534, c0535*, BH); Ontario (*Reed 60232, 60243*, MO-REED); Queens (*Trigoboff c0513*, BH; *c0515*, BH & NYS); Richmond (*Davis s.n.*, NY); Schyler (*Trigoboff c0591*, BH); Seneca (*Trigoboff c0590*, BH); Suffolk (*Trigoboff c053*, BH & NYS); Tompkins (*Cleavitt 1598, 1602*; *O'Rourke 2*; *Trigoboff c0579, Werier b-301*, BH; *Trigoboff c0025,* BH & NYS; *Trigoboff c0025a*, NYS) Ulster; (*Haring 4588*, NY); and Wyoming (*Bassett s.n.*, MO).

*Tortula papillosa* looks very different wet and dry. Field identification is easy in both cases. When wet, the leaves, which have broadly rounded tips, spread and expose masses of distinctive globose gemmae on the upper surface of the costa. When dry, masses of *T. papillosa* appear blacker or grayer – due to the awn and prominent pale costa – than the *Othotrichum* spp. that almost always grow with it. Wetting the leaves reveals the gemmae and confirms the identification. *T. papillosa* occurs as scattered plants and in large pure growths, in cracks and depressions, rarely on the raised areas of the bark, at the tree base, on the trunk (to at least 3 m high) and less often on the upper surface of large horizontal branches and in and around crotches. It occurs on many different species of deciduous trees and cedar (*Davis s.n.*; *Haring 4588*, NY). The easiest way to find it is to check roadside trees in urbanized areas, especially large Norway and sugar maples that have a good growth of *Orthotrichum* (probably mostly *O. pumilum*, *O. pusillum* and/or *O. obtusifolium*). *Leskea polycarpa* is usually present. Less consistent associates include *Platygyrium repens*, *Frullania eboracensis*, *Entodon* spp., *Ceratodon purpureus*, *Bryum argenteum*, *Bryum capillare*, *Pylaisiella* and *Plagiomnium cuspidatum.*

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*Tortula pagorum* (Milde) De Not. is smaller and somewhat similar. It differs most obviously from *T. papillosa* in having leaf-like gemmae clustered at the tip of the plant (Crum and Anderson, 1981). Like *T. papillosa*, the gemmae are hidden when the plant is dry. *T. pagorum* occurs in 3 Long Island counties: Nassau (*Trigoboff c04170*, *c04177*, *c058*, BH); Queens (*Trigoboff c0514*, BH; *c0516*, BH & NYS) and Suffolk (*Trigoboff c052*, BH). These collections were from cracks and depressions in bark at the bases (up to 1 m high) of roadside Norway maples over 60 cm diameter with exposed surface roots hugging the base of the tree, on urban and suburban side streets. The *T. pagorum* here is less common and generally less abundant than *T. papillosa.*

*Tortula pagorum* did not appear in Ketchledge's (1980) moss checklist of New York. It is known from 3 adjacent states: New Jersey (*364419*, NY), Connecticut (*365374*, NY) and Pennsylvania (*Zander 4641*, MO). According to Anderson (1943), "In the eastern United States, it is almost completely confined to human habitation." (He speculated that smoke may promote its establishment. I wonder whether the greater numbers, faster speeds and broader tires of today's vehicles, which kick up more road dust year round, are relevant. Perhaps, increased numbers of Norway maples have favored both *T. pagorum* and *T. papillosa.*) In the southwest, *T. pagorum* is independent of habitation and lacks the weedy aspects of its eastern range. Anderson concluded that "*T. pagorum* is native to the southwestern United States and entirely adventive in the eastern part of the continent."

In dry weather, small patches of *T. pagorum* are extremely difficult to spot in the field. Besides being uncommon, the plants are tiny, dark, low on the tree, recessed in bark crevices and greatly outnumbered by superficially-similar *Orthotrichum*. Just after a rain is the best time to search because the leaves spread widely and turn a lighter green than most of the *Orthotrichum* that grow with it. For both species of *Tortula*, areas where the streets form a grid are the easiest to search. If the leaves are down, at each intersection you can look far, both ways, for the silhouette and bark color of large roadside maples and then choose the direction with the most suitable trees. As your car – or better, bicycle – passes each tree, you can see if there's a good growth of moss and so whether it's worth it to stop and look closer. Leaning the bicycle against the tree makes a risky but convenient step ladder.

In Australia, these two species of *Tortula* commonly occur together on tree trunks and sometimes concrete walls. The *T. pagorum* there is more abundant in drier regions and the *T. papillosa* in wetter ones (Scott and Stone, 1976; Scott, 1997). Sporophytes of both species have been found in Australia, but not in the United States. In the United States, *T. papillosa* sometimes occurs on calcareous rock and mortared walls; and *T. pagorum* sometimes occurs on rocks, bricks and stone walls (Crum & Anderson, 1981). In New York State, *T. papillosa* has been found on a mortared stone wall (*Eckel 192284n*, BUF; Eckel, 1985) and on ordinary shingles on the roof of a shed (*Trigoboff c0555*, BH) – here growing with 14 other mosses, including *Tortula ruralis* and *Lindbergia brachyptera* (*Trigoboff c0554*, BH).

Visch (1976) reported that in New Zealand, "*Tortula papillosa* was almost exclusively growing on the southern, shaded side of the trunk..." Schnooberger (1942) reported that in Michigan, "It has a tendency to grow on the exposed or sunny side of trees." In New York State, the two *Tortulas* do not favor any side of the tree with respect to the sun, compass, road, sidewalk or lawn.

*Tortula pagorum* and to a lesser extent *T. papillosa* generally do not attach to the bark, but rather to a blackish layer of what I propose we call "schmutz" because there seems to be no existing term specifically for the wind-blown sand, detritus and miscellaneous fine materials that accumulate on vertical surfaces such as tree trunks, especially in cracks and depressions, and continue to accumulate on (and be generated by) the growing mosses, lichens, algae, fungi and bacteria. "Aeolian deposit" usually refers to fairly large amounts of wind-deposited materials on land.

When wet, the moss and schmutz may be scooped from crevices in the bark with remarkable ease. In my experience, these two *Tortulas* and most other bryophytes are collected best with an old credit card beveled along one edge. The card flexes and so follows the irregular surfaces of trees, rocks and ground much better than a knife. The card is faster, safer, scrapes off larger, more intact masses of plants, collects less wood, rock, soil and schmutz, and tells more about how strongly or weakly the moss attaches to the substrate. Property-owners are less likely to be concerned with tree damage. And pedestrians and police in urban areas are less likely to feel threatened.

I examined all specimens cited except *Eckel 192284n*, and *Bassett s.n.* These were being moved from BUF to MO.

**Acknowledgement** -- I thank BH and NY for access to facilities, specimens and literature; NYS and MO for loans of specimens; Robert Dirig and Nat Cleavitt for reading a draft of this article; and Harold Trigoboff for helping with collections downstate.

## References

Anderson, L. E. 1943. The Distribution of *Tortula pagorum* (Mild.) De Not. in North America. Bryologist 46: 47-66.

Clemants, S. E., Ketchledge, E. H. 1990. Ecosystem Management: Rare Species and Significant Habitats, New York State Museum Bulletin 471, p. 211-216, Flora Protection: The Question of Rare Mosses in New York State.

Crum, H. A., Anderson, L. E. 1981. Mosses of Eastern North America. New York: Columbia University Press.

Eckel, P. M. 1985. *Orthotrichum obtusifolium* and *Tortula papillosa* in western New York State. Evansia 2(1): 11-12.

Ketchledge, E. H. 1980. Revised Checklist of the Mosses of New York State. New York State Museum Bulletin 440. Albany.

Schnooberger, I. 1942. Distribution of *Tortula papillosa* Wils. The Bryologist. 45: 24-27.

Scott, G.A.M. 1997. A Conservation Overview of Australian Non-marine Lichens, Bryophytes, Algae and Fungi: Bryophytes. Australian Government Department of the Environment and Heritage. (http://www.deh.gov.au/biodiversity/threatened/action/cryptogams/8.html) on January 10, 2005.

Scott, G. A. M., Stone, I. G. 1976. The Mosses of Southern Australia. London: Academic Press.

Visch, M. 1976. *Tortula papillosa.* Canterbury Botanical Society Journal. 9: 221-24.

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The aim of *Evansia* is to provide a vehicle for the presentation and exchange of useful information on North American bryophytes and lichens. Articles are frequently popular in nature rather than technical and are intended to teach and inform both amateurs and professionals. The articles include, but are not restricted to, announcements of and reports on forays and meetings, presentations of techniques and aids for studying and curating lichens and bryophytes, and reports on local floras. Checklists and papers documenting new regional, state, or county records must include voucher specimens (collector and collection number) and an indication of where the specimens are deposited or a literature reference.

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# EVANSIA

Volume 22 Number 3

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**First Record for Anthocerotales in the Mojave Desert**
Eve Laeger 90

**Formation of the Ohio Moss and Lichen Association, and Report of the First Fall Foray to the Edge of Appalachia Preserve System, Adams Co., Ohio**
Barbara K. Andreas, Ray E. Showman and Mark H. Zloba 92

***Sphagnum tenellum*** **reported for the first time in West Virginia**
John Atwood 101

**Lichen Flora of the Southwestern Mojave Desert: Key's Ranch, Joshua Tree National Park, San Bernardino County, California, USA**
Kerry Knudsen and Tasha La Doux 103

**Additions to the Lichen Flora of Alabama I.**
Curtis J. Hansen and Roland R. Dute 110

**Announcement Board**
Attention: please review important information about changes to Evansia in 2006. 117

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Editors note:

- "Announcement Board". Please submit information about Bryological or Lichenological field trips, seminars, or meetings. Please include dates, locations and contact information. Deadlines for announcements will be March 1st (issue 1), June 1st (issue 2), September 1st (issue 3), and December 1st (issue 4).
- ABLS Executive Committee approved changes for Evansia effective 2006. Details will be available in issue 22(4).

Evansia volume 22, number 2 was distributed on 30 June 2005

# First Record for Anthocerotales in the Mojave Desert

Eve Laeger [1]

**Abstract** -- With the collection of the hornwort *Phaeoceros carolinianus* (Michx.) Prosk, the first occurrence of Anthocerotales is recorded in the Mojave Desert Floristic Province of California.

Jim Shevock and the author have collaborated on bryophyte collecting in the California Mojave Desert Floristic Province since 2002. The winter of 2004-05 brought copious amounts of rainfall to desert locations, allowing for a perfect opportunity to collect bryophytes complete with sporophytes. In spite of a name such as Death Valley, this large 3 million acre National Park is home to an astonishing suite of bryophytes. The biggest surprise came this year in April on a collecting trip to Jail Canyon on the west side of the Panamint Range on its northern end. The Panamints are renowned for its high point, Telescope Peak, which at 11,000' often holds its snow late into spring. It drains in part into Jail Canyon. The majority of this mountain range, however, is extremely arid. Rainfall is quite altitude dependent with averages up to 8 inches per year above the pinyon woodland, and down to about 6 inches per year at the 4000' level where the hornwort was found. The author hiked up the choked canyon full of willows, *Baccharis sergioides* A. Gray, and 5 foot *Equisetum hyemale* L. ssp. *affine* (Engelm.) Calder & R.H. Taylor and was stunned to find a large and thriving population of hornworts with sporophytes.

The hornwort was found along the edge of a perennial creek within thickets of *Salix* and *Baccharis*. It was especially abundant in shade and under *Equisetum*. It was also associated with *Aneura pinguis* (L.) Dum. an interesting record of its own; this is now the second location for this taxon in the Panamint Range. The hornwort also grew intermixed with *Riccardia chamedryfolia* (With.) Grolle, another record of interest. Other associated plants included *Epipactis gigantea* Hook, *Pohlia nutans* (Hedwig) Lindberg, and *Conardia compacta* (C. Müller Hal.) H. Robinson.

---

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USA: California, Inyo Co. Jail Canyon in the Panamint Range, elevation 3800 feet, N 36° 11' 31.6" W 117° 10' 24.0", April 22, 2005, *Laeger 2594* (CAS &UC) and May 13, 2005 *Laeger 2623* (CAS & UC).

Thallus characteristics and the presence of yellow spores in developing capsules resulted in a preliminary determination of the hornwort as a species of *Phaeoceros*. A later collection was made for mature capsules. Both collections, *Laeger 2594 & 2623* were sent to Bill Doyle who identified the plants as *P. carolinianus* (Michx.) Prosk.

**Significance** -- This is the first record of *P. carolinianus* or of any Anthercerotales in the Mojave Desert. The closest known site of *P. carolinianus* is near the Coffee Campground along Cal. Highway 190, on the western slope of the southern Sierra Nevada in Tulare Co., Calif. (*Doyle 2522*, UC) some 80 air miles west of the Jail Canyon site. The hornwort *Anthoceros fusiformis* Aust. occurs at several locations in the Sequoia and Kings Canyon National Parks (Doyle, pers. comm.), some 85 air miles west of the Panamint Range. The abundant vegetative growth and sporophyte development of *P. carolinianus* in the Panamint Range indicate that suitable habitats for this and other hornworts do exist in the Mojave Desert. Searches should be made for shaded, perennially flowing streams.

**Acknowledgements** -- Gratitude is given to Dr. Bill Doyle for his assistance with determinations and distribution information. Thanks to Jim Shevock and Dan Norris for support and moss determinations. Dana York provided details on the perennial nature of the Panamint Range creeks and data on rainfall. Herb Laeger, John Newman, Linda Adams, Brad Alexander and Kathy Davis are appreciated as fine hiking companions.

# Formation of the Ohio Moss and Lichen Association, and Report of the First Fall Foray to the Edge of Appalachia Preserve System, Adams Co., Ohio

Barbara K. Andreas[1], Ray E. Showman[2] and Mark H. Zloba[3]

**Abstract** -- The Ohio Moss-Lichen Association was formed in 2004. Its first fall foray was held on October 23 -24, 2004 at the Edge of Appalachia Preserve System, Adams County, OH. A total of 65 lichens, 49 mosses and 5 liverworts were recorded.

**Introduction** -- Although lichens and mosses are relatively well-known for Ohio (Showman and Flenniken 2004, Snider and Andreas 1996), additional field work is needed to clarify distributions at the county and ecoregion level. A few areas, such as Crane Hollow Nature Preserve, Hocking County, OH, have been extensively inventoried for both groups (Snider and He 1990, Showman 1987). Others have been studied for either bryophytes (Andreas 2001, Andreas and Lucas 2005) or lichens (Showman 1993, 1994, 1997). There are many state parks, state and national forests, nature preserves and private holdings where a list of cryptogams would be a valuable resource.

The Ohio Department of Natural Resources includes cryptogams on the state rare plant list (Division of Natural Areas and Preserves 2004). If cryptogams were listed based on the criteria developed for vascular plants (numbers of records in the past 20 years), a large percentage of the moss and the lichen flora of the state would be placed on the list as endangered, threatened or potentially threatened. Andreas and Showman, members of the Rare Plant Council, are reluctant to propose taxa to the rare plant list

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because of limited knowledge of occurrences for these under-collected groups. Field data are needed at a time when botanical collecting, even of vascular plants, is low (Prather et al. 2004).

A new organization, the Ohio Moss and Lichen Association (OMLA), was formed to gather field records for under-collected areas and to promote the study of cryptogams in Ohio. An organizational meeting was held at Gorman Nature Center (Lexington, OH) in June, 2004. At that time the first Fall Foray was planned for October 23 - 24, 2004 at the Richard and Lucile Durrell Edge of Appalachia Preserve System, co-owned by The Nature Conservancy and Cincinnati Museum Center at Union Terminal. Twenty cryptogam enthusiasts met and conducted field trips to several areas within the preserve. The foray species list for lichens is presented in Table 1, and for bryophytes in Table 2.

The second Fall Foray is scheduled for September 30 – October 2, 2005 in the Wayne National Forest, Lawrence County, Ohio. Snider and Andreas (1996) reported 43 moss taxa (of 400 Ohio taxa) from Lawrence County. Showman and Flenniken (2004) reported 52 macrolichen species for this county (of 223 for Ohio). There are recent records (post-1965) for 32 of these lichen taxa.

**Description of the Study Site** -- The Edge of Appalachia Preserve System is located in the Outer Bluegrass physiographic region (Brockman 1998) in southwest Ohio, approximately 65 miles east-southeast of Cincinnati. The area has moderately high relief, 91 m [300 feet], with elevation ranging from 138 – 340 m (455-1120 feet). Dolomites, limestones and calcareous shales of Ordovician and Silurian age dominate the preserve. In a few areas acidic shales of Devonian age and Waverly sandstones of Mississippian age cap the hills. The Outer Bluegrass physiographic region is the only area in Ohio of exposed limestone and dolomite that remained unglaciated during the Pleistocene.

The Edge of Appalachia Preserve is composed of mostly mixed oak and mixed mesophytic forest dotted with cedar barrens. Influenced by receding northern glaciers, ancient lakes and rivers, and thousands of years changing climate, its unglaciated hills and valleys contain rock layers from several geologic eras. This geology exposes the alkaline soils of Brassfield Limestone, up through Estill shale, then Lilly-Bisher and Peebles Dolomite cliffs, and the acidic soils of Ohio shale and Waverly sandstones (Knoop 1996).

**Methods and Materials** -- Common lichen species were identified in the field while scarcer species were collected for verification using manuals such as Brodo et al. (2001), Flenniken (1999) and Showman & Flenniken (2004). Sources used to identify bryophyte collections in the laboratory include Vitt and Buck (1992), Crum and Anderson (1981), Ley and Crow (1999), and Crum (1991). Voucher specimens for lichens and bryophytes are housed at, and are available for inspection from, the Edge of Appalachia Field Office, 3223 Waggoner-Riffle Rd., West Union, OH 45693(eoa@bright.net). Duplicate bryophyte vouchers are at the Kent State University Bryophyte Herbarium (KE).

**Discussion** -- The highlight of the foray was a hike to Buzzardroost Rock (Brush Creek Twp.) on October 23. Mosses and lichens were found on a variety of tree species, on alkaline soil, and on dolomitic and sandstone rocks.

The lichens observed or collected included 65 species, with several rare species reported.

The ridge top adjacent to Buzzardroost Rock consists of open forest of primarily chestnut oak. These trees support *Canoparmelia caroliniana* (Nyl.) Elix & Hale, *C. texana* (Tuck.) Elix & Hale and *Punctelia perreticulata* (Räsänen) G. Wilh. & Ladd, as well as a number of more common species. This is the only known location in the state for *C. caroliniana* and *P. perreticulata. Canoparmelia texana* was first recorded in the state from this location but has since been found in similar habitat at three other Ohio counties, usually at a single location in each county.

After returning from "the Rock" another rare species, *Phaeophyscia leana* (Tuck.) Essl. was seen at a site in the Ohio Brush Creek flood plain (Green Twp.). This lichen grows on the lower part of the trunks of riparian trees that are periodically inundated by floodwaters. It was usually found with the moss *Leskea gracilescens* Hedw., but other lichens were absent. A normal lichen association was present on the upper part of the tree trunks (above the zone of inundation).

Originally, *Phaeophyscia leana* was known only from the type collection site, Hamilton County, OH (Lea collection, 1839). The habitat at the type location was destroyed, and for well over a century, this lichen was thought to be extinct. It was found in southern Illinois by Alan Skorepa (1984), and subsequent intensive searching led to records from a few other sites in southern Illinois, western Kentucky and southern Indiana. This rare lichen was recently rediscovered in Ohio by Barbara Lund, at two Ohio River riparian sites in Adams County. The Ohio Brush Creek location visited by the group was discovered by Mark Zloba. For a more detailed account of this interesting species see Gillespie and Methven (2002).

Another rare species was seen on a soil bank along the road leading to the Rieveschl Chalet (Green Twp). *Collema coccophorum* Tuck. is one of the "gelatinous lichens" characterized by having a cyanobacterium as the photobiont. This species is known in Ohio only from Adams County, where it has been recorded from several locations within the Edge of Appalachia preserve system.

Of the 53 bryophytes collected, the most interesting was *Ptychomitrium incurvum* (Schwaegr.) Spruce, growing with *Forsstroemia trichomitria* (Hedw.) Lindb. on an exposed Peebles dolomitic rock face at Buzzardsroost Rock. Osterbrock and Snider (1985) reported 93 bryophytes from Buzzardroost Rock and Red Rock (both within the Edge of Appalachia Preserve). *P. incurvum* was previously reported for Adams County (Snider and Andreas 1996), but not from the Edge of Appalachia Preserve System. *Platydictya jungermannioides* (Brid.) Crum, also previously reported from Adams County, was found growing in crevices on Lilly-Bisher dolomite on a slope near the Rieveschl Chalet. This taxon is known in Ohio only from Adams County.

Snider and Andreas (1996) listed 174 moss taxa from Adams County, which has the third highest number of taxa in the State (Hocking County, with 215 taxa, is highest). Four new county records were added from this foray: *Bryum argenteum* Hedw., *Hypnum pallescens* (Hedw.) P. Beauv. var. *pallescens*, *Oxystegus tenuirostris* (Hook. & Tayl.) A.J.E. Sm., and *Plagiothecium cavifolium* (Brid.) Iwats.

**Table 1.** Lichens identified on the fall foray of the Ohio Moss – Lichen Association, October 23-24, 2004. Nomenclature follows Esslinger (1997). Voucher specimens are housed at the Edge of Appalachia Field Office, 3223 Waggoner-Riffle Rd., West Union, OH 45693.

| |
|---|
| *Arthonia caesia* (Flotow) Körber |
| *Buellia stillingiana* J. Steiner |
| *Caloplaca cerina* (Ehrh. ex Hedwig) Th. Fr. |
| *Caloplaca flavovirescens* (Wulfen) Dalla Torre & Sarnth |
| *Candelaria concolor* (Dickson) Stein |
| *Canoparmelia caroliniana* (Nyl.) Elix & Hale |
| *C. crozalsiana* (B. de Lesd. ex Harm.) Elix & Hale |
| *C. texana* (Tuck.) Elix & Hale |
| *Cladonia apodocarpa* Robbins |
| *Cladonia cervicornis* (Hoffm.) Ahti |
| *Cladonia coniocraea* (Flörke) Sprengel |
| *Cladonia cristatella* Tuck. |
| *Cladonia furcata* (Hudson) Schrader |

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| |
|---|
| *Cladonia grayi* G. Merr. ex Sandst. |
| *Cladonia peziziformis* (With.) J. R. Laundon |
| *Cladonia polycarpoides* Nyl. |
| *Cladonia subtenuis* (Abbayes) Mattick |
| *Collema coccophorum* Tuck. |
| *Dermatocarpon miniatum* (L.) W. Mann |
| *Endocarpon pusillum* Hedwig |
| *Flavoparmelia caperata* (L.) Hale |
| *Heterodermia obscurata* (Nyl.) Trevisan |
| *Heterodermia speciosa* (Wulfen) Trevisan |
| *Hypogymnia physodes* (L.) Nyl. |
| *Hypotrachyna livida* (Taylor) Hale |
| *Hypotrachyna showmanii* Hale |
| *Imshaugia aleurites* (Ach.) S. F. Meyer |
| *Imshaugia placorodia* (Ach.) S. F. Meyer |
| *Lecanora hybocarpa* (Tuck.) Brodo |
| *Lecanora strobilina* (Sprengel) Kieffer |
| *Lecanora symmicta* (Ach.) Ach. |
| *Leptogium cyanescens* (Rabenh.) Körber |
| *Leptogium juniperinum* Tuck. |
| *Melanelia subaurifera* (Nyl.) Essl. |
| *Myelochroa aurulenta* (Tuck.) Elix & Hale |
| *Myelochroa galbina* (Ach.) Elix & Hale |
| *Parmelia sulcata* Taylor |
| *Parmelinopsis minarum* (Vainio) Elix & Hale |
| *Parmotrema hypotropium* (Nyl.) Hale |
| *Parmotrema stuppeum* (Taylor) Hale |
| *Peltigera canina* (L.) Willd. |
| *Pertusaria pustulata* (Ach.) Duby |
| *Phaeophyscia adiastola* (Essl.) Essl. |
| *Phaeophyscia cernohorskyi* (Nádv.) Essl. |
| *Phaeophyscia leana* (Tuck.) Essl. |
| *Phaeophyscia rubropulchra* (Degel.) Essl. |
| *Phaeophyscia squarrosa* Kashiwadani (Moberg 1995) |
| *Physcia aipolia* (Ehrh. ex Humb.) Fürnr. |
| *Physcia Americana* G. Merr. |
| *Physcia millegrana* Degel. |
| *Physcia stellaris* (L.) Nyl. |
| *Placynthium nigrum* (Hudson) Gray |
| *Punctelia bolliana* (Müll. Arg.) Krog |
| *Punctelia missouriensis* G. Wilh. & Ladd |
| *Punctelia perreticulata* (Räsänen) G. Wilh. & Ladd |
| *Punctelia rudecta* (Ach.) Krog |
| *Punctelia subrudecta* (Nyl.) Krog |

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|---|
| *Pyrrhospora varians* (Ach.) R. C. Harris |
| *Pyxine sorediata* (Ach.) Mont. |
| *Pyxine subcinerea* Stirton |
| *Sarcogyne regularis* Körber |
| *Usnea strigosa* (Ach.) Eaton |
| *Verrucaria muralis* Ach. |
| *Verrucaria nigrescens* Pers. |
| *Xanthomendoza fluva* (Hoffm.) Søchting, Kärnefelt & S. Kondr. |

| **Table 2.** Bryophytes identified on the fall foray of the Ohio Moss – Lichen Association, October 23-24, 2004. Nomenclature follows Anderson et al. (1990) and Ley and Crowe (1999). Voucher specimens are housed at the Edge of Appalachia Field Office, 3223 Waggoner-Riffle Rd., West Union, OH 45693. |
|---|
| **Liverworts** |
| *Frullania eboracensis* Gott. |
| *Lejeunea cavifolia* (Ehrh.) Lindb. |
| *Mannia fragrans* (Balb.) Frey & L. Clark |
| *Porella platyphylla* (L.) Pfeiff. |
| *Radula complanata* (L.) Dum. |
| **Mosses** |
| *Anomodon attenuatus* (Hedw.) Hüb. |
| *Anomodon minor* (Hedw.) Fürnr. |
| *Anomodon rostratus* (Hedw.) Schimp. |
| *Barbula unguiculata* Hedw. |
| *Bryoandersonia illecebra* (Hedw.) Robins. |
| *Bryum argenteum* Hedw. |
| *Campylium chrysophyllum* (Brid.) J. Lange |
| *Campylium hispidulum* (Brid.) Mitt. |
| *Ctenidium malacodes* Mitt. |
| *Dicranella varia* (Hedw.) Schimp. |
| *Dicranum montanum* Hedw. |
| *Dicranum polysetum* Sw. |
| *Dicranum scoparium* Hedw. |
| *Entodon cladorrhizans* (Hedw.) C. Müll. |
| *Entodon seductrix* (Hedw.) C. Müll. |
| *Fissidens bryoides* Hedw. |
| *Fissidens dubius* P. Beauv. |
| *Fissidens subbasilaris* Hedw. |
| *Fissidens taxifolius* Hedw. |
| *Forsstroemia trichomitria* (Hedw.) Lindb. |
| *Gymnostomum aeurginosum* Sm. |

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| |
|---|
| *Haplohymenium triste* (Ces. *in* De Not.) Kindb. |
| *Homalotheciella subcapillata* (Hedw.) Broth. |
| *Hygroamblystegium tenax* (Hedw.) Jenn. var. *tenax* |
| *Hyophila involuta* (Hook.) Jaeg. |
| *Hypnum curvifolium* Hedw. |
| *Hypnum pallescens* (Hedw.) P. Beauv. var. *pallescens* |
| *Leskea gracilescens* Hedw. |
| *Leucobryum albidum* (Brid. *ex* P. Beauv.) Lindb. |
| *Othrotrichum stangulatum* P. Beauv. |
| *Orthotrichum stellatum* Brid. |
| *Oxystegus tenuirostris* (Hook. & Tayl.) A.J.E. Sm. |
| *Plagiomnium cuspidatum* (Hedw.) T. Kop. |
| *Plagiothecium cavifolium* (Brid.) Iwats. |
| *Platydictya jungermannioides* (Brid.) Crum |
| *Platygyrium repens* (Brid.) Schimp. *in* B.S.G. |
| *Polytrichum ohioense* Ren. & Card. |
| *Ptychomitrium incurvum* (Schwaegr.) Spruce |
| *Rhodobryum roseum* (Hedw.) Limpr. |
| *Rhytidium rugosum* (Hedw.) Kindb. |
| *Schistidium apocarpum* (Hedw.) Bruch & Schimp. *in* B.S.G. |
| *Schistidium rivulare* (Brid.) Podp. var. *rivulare* |
| *Steerecleus serrulatus* (Hedw.) Robins. |
| *Taxiphyllum deplanatum* (Bruch & Schimp. *ex* Sull.) Fleisch. |
| *Thelia hirtella* (Hedw.) Sull. *in* Sull. & Lesq. |
| *Thuidium delicatulum* (Hedw.) Schimp. *in* B.S.G. |
| *Thuidium recognitum* (Hedw.) Lindb. |
| *Tortella humilis* (Hedw.) Jenn. |
| *Weissia controversa* Hedw. |

## References

Anderson, L.E., H.A. Crum, and W. R. Buck. 1990. List of the mosses of North America north of Mexico. The Bryologist 93: 448 – 499.

Andreas, B.K. 2001. The bryophyte flora of the Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. Unpublished report submitted to The Ohio National Guard, Ravenna, OH.

Andreas, B.K. and D.L. Lucas. 2005. The bryophyte flora of Jefferson County, OH. Castanea (in review).

Brockman, C.S. 1998. Physiographic regions of Ohio. (1 map + descriptive text). Ohio Division of Geological Survey, Ohio Department of Natural Resources, Columbus, OH.

Brodo, I. M. , S. D. Sharnoff & S. Sharnoff. 2001. Lichens of North America. Yale University Press. New Haven, CT.

Crum, H.A. 1991. Liverworts and Hornworts. University of Michigan Herbarium, Ann Arbor, Michigan.

Crum, H.A. and L.E. Anderson. 1981. Mosses of eastern North America. Vols. I, II. Columbia University Press, New York, NY.

Division of Natural Areas and Preserves. 2004. Rare Native Ohio Plants, 2004-05 Status List. Ohio Dept. of Natural Resources, Columbus, OH.

Esslinger, T. L. 1997. A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. North Dakota State University: http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.htm (First Posted 1 December 1997, Most Recent Update 2 March 2004), Fargo, North Dakota.

Flenniken, D. G. 1999. The Macrolichens in West Virginia. Published by the author, D. G. Flenniken, Sugarcreek, OH.

Gillespie, R. N. & A. S. Methven. 2002. *Phaeophyscia leana* – A lichen species at the edge. http://www.eiu.edu/~biology/posters/2002/poster_017.htm

Knoop, J. 1995. Hunting for hanging prairies. Ohio Southland 6: 42-46.

Ley, L.M. & J.M. Crowe. 1999. An Enthusiasts Guide to Liverworts and Hornworts of Ontario. Claude Garton Herbarium, Lakehead University, Thunder Bay, Ontario, Canada.

Osterbrock, A. J. and J.A. Snider. 1985. A checklist of the bryophytes of the Edge of Appalachia preserve system, Adams County, Ohio. Ohio J. Sci. 85 (3) 138-143.

Prather, L.A., O. Alvarez-Fuentes, M.H. Mayfield, and C.J. Ferguson. 2004. The decline of plant collecting in the United States: a threat to the infrastructure of biodiversity studies. Systematic Botany 29: 15-28.

Showman, R. E. 1987. Macrolichen flora of Crane Hollow, Hocking County, Ohio. Ohio J. Sci. 87:27-29.

Showman, R. E. 1993, 1994. Unpublished reports to the Ohio Division of Natural Areas and Preserves, Ohio Dept. of Natural Resources, Columbus, OH.

Showman, R. E. 1997. Lichen biomonitoring for air pollution at selected Ohio state forests. http://www.dnr.state.oh.us/forestry/health/lichen/lichenarticle.htm

Showman, R. E. & D. G. Flenniken. 2004. The Macrolichens of Ohio. Ohio Biological Survey Bulletin (New Series) 14 no. 3. Columbus, OH 279 pp.

Skorepa, A. C. 1984. The rediscovery of *Phaeophyscia leana.* The Bryologist 87: 257.

Snider, J.A. and B. K. Andreas. 1996. A catalog and atlas of the mosses of Ohio. Ohio Biol. Surv. Misc. Cont. No. 2, Columbus, OH.

Snider, J.A. and S. He. 1990. A catalogue of the bryophyte flora of Crane Hollow Nature Preserve, Hocking County, Ohio. Unpublished manuscript. Crane Hollow Preserve, Laurelville, OH.

Vitt, D. and W. Buck. 1992. Key to the Moss Genera of North America North of Mexico. Contr. Univ. Mich. Herb. 18: 43-71.

# *Sphagnum tenellum* reported for the first time in West Virginia

John Atwood[1]

**Abstract** -- *Sphagnum tenellum* (Brid.) Bory is reported for Tucker County, West Virginia. In eastern North America *S. tenellum* is typically a coastal species, and its presence in West Virginia suggests that it may be more or less continuously distributed throughout the mountains of eastern North America.

While annotating bryophyte specimens in the YUO herbarium, I discovered a collection of *Sphagnum tenellum* (Brid.) Bory from Tucker County, West Virginia that had been previously misdetermined as *S. palustre* L. *Sphagnum tenellum* has a golden-brown color and a delicately loose, weakly stemmed appearance. Plants of *S. tenellum* have enlarged branch cortical cells with conspicuously long-necked retort cells. In addition, the stem and branch leaves are similar in size and shape, 1.0–1.5 mm long, and ovate with incurved upper margins and serrated apices. The chlorophyllose cells of the branch leaves, in cross section, are equilateral-triangular with their greatest amount of exposure facing the dorsal surface of the concave leaves. Likewise, the hyaline cells of the branch leaves, in cross section, are largely convex on the ventral surface and only minimally convex on the dorsal surface.

In eastern North America, *S. tenellum* is primarily a coastal species that occurs in mineral poor habitats from Labrador and Newfoundland to New Jersey. *Sphagnum tenellum* is also found in the interior mountains of New York and North Carolina. The presence of *S. tenellum* in West Virginia connects these two inland distributions and suggests that the species may be more or less continuously distributed in the mountains of eastern North America.

The collection of *S. tenellum* was made in the Dolly Sods Wilderness Area, a part of the Allegheny Front within the Monongahela National Forest in northeastern West Virginia. Dolly Sods takes it name after the Dahle family, who farmed the land in the early 1800's and grazed their animals on the mountaintop. This plateau of flat rocky plains, ericaceous

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shrublands, and spring fed bogs yield a flora rich in northern relics as a result of the advance and retreat of glaciers during the Pleistocene. Gibson (1970) sampled the vegetation zones of Alder Run Bog within the Sods and correlated the unusual flora to the lack of minerals in the sandstone bedrock and the poorly drained springs that result in varying levels of acidity.

West Virginia. Tucker County: Dolly Sods Wilderness Area, ±1250 m., 15 September 1979, *Sturm* (YUO).

**Acknowledgments** -- Thanks are extended to Lewis Anderson for confirming the determination of *Sphagnum tenellum* and YUO for the use of their collections.

## References

Gibson, J. R. 1970. The Flora of Alder Run Bog, Tucker County, West Virginia. Castanea 35: 81–98.

# Lichen Flora of the Southwestern Mojave Desert: Key's Ranch, Joshua Tree National Park, San Bernardino County, California, USA

Kerry Knudsen[1] and Tasha La Doux[2]

**Abstract** -- Thirty-four genera and 47 species are reported from the Key's Ranch area in Joshua Tree National Park in the southwestern Mojave Desert of California. The flora differs substantially from other floristic reports from the Mojave Desert. Four species, *Acarospora obnubila*, *Lecania polycycla*, *Placopyrenium noxium*, and *Verrucaria compacta* are reported new for California.

**Keywords** -- Lichens, Mojave Desert, California, Joshua Tree National Park, Key's Ranch

**Introduction** -- The Mojave Desert covers over 25,000 square miles of southeastern California and portions of Nevada, Arizona and Utah. Unlike the Sonoran desert, which has been relatively well collected except in southern California, the Mojave Desert represents a vast frontier for lichenologists. Only five recent reports (Doell 1999, Knight et al 2002, Jackson et al 2005, Knudsen in press, and the soon-to-be-published Snow Canyon, Utah study) have begun the lichenological survey of this extensive desert of interlocking mountain ranges and valleys. We are a long way from producing a complete lichen flora of the Mojave Desert.

**Study Area** -- The area surveyed for this study is located in the Little San Bernardino Mountains within Joshua Tree National Park in San Bernardino County, California (34° 2.82' N, 116° 10.16'W, elev. 1267 meters). Specifically, we visited the area above and around "Key's Ranch", which is an early 20th century homestead listed on the National Register of Historic Places. The local geology of this area consists of Cretaceous (74-106 Mya) two-mica bearing quartz monzonite (Barth et al 2004); the general

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appearance is literally a labyrinth of desert dry washes among boulder-strewn granitic outcrops. The average annual rainfall is close to 8 inches in these higher areas of the Park. Winter and summer precipitation is normal.

**Vascular Plants** -- The dominant vegetation among the granitic outcrops consists of *Pinus monophylla*, *Quercus john-tuckerii*, *Nolina parryi*, *Ericameria cuneata* var. *cuneata*, *Opuntia chlorotica*, and *Achnatherum speciosum*, whereas the slopes or pockets have *Yucca schidigera*, *Opuntia phaeacantha*, *Opuntia basillaris*, *Ericameria linearifolia*, *Prunus fasciculatum*, *Krameria grayii*, *Eriogonum fasciculatum*, and *Pleuraphis rigida*. There are several small ephemeral washes in the area where *Chilopsis linearis*, *Acacia greggii*, and *Baccharis sergiloides* are abundant. The vegetation in this area can be characterized as the Mojave Yucca series (Sawyer and Keeler-Wolf 1995) or Mixed Mojave Steppe (Holland 1986). In addition, recent surveys completed by T. La Doux have revealed four previously undocumented rare plant populations in this area: *Calochortus striatus* Parish (Alkali Mariposa Lily), *Monardella robisonii* Epl. (Robison's Monardella), *Muhlenbergia appressa* C. Goodd. (Appressed Muhly), and *Matelea parvifolia* (Torr.) Woodson (Spearleaf) (CNPS 2001).

**Methods and Material** -- Collections were made by Kerry Knudsen with Tasha La Doux on March 31 & May 26, 2005. The first day we were accompanied by Nicole Pietrasiak, who is studying soil crust plots in the area, and National Park intern Wren Babich. The study was qualitative, random and intuitive, with about nine hours of collecting (Rosentretter & Eldridge 2002).

Unless otherwise noted, determinations of specimens were done by Kerry Knudsen using standard lichen keys, generally the Sonoran lichen flora (Nash et al 2002 & 2004) as well as unpublished treatments, types, and verified specimens. Three specimens were analyzed with TLC by James C. Lendemer. *Phaeophyscia sciastra* was determined by Theodore L. Esslinger.

All specimens were vouchered, except for two observations. The numbers for the collections are Kerry Knudsen's with Tasha LaDoux as co-collector. They were deposited at the UCR herbarium in Riverside, California and are accessible online at http://www.herbarium.ucr.edu/UCRDB.html. Duplicates are deposited at the Joshua Tree National Park herbarium in Twentynine Palms, California, in a synoptic collection. Lichenicoles collected are not listed and reserved for further study.

The relative abundance and rarity of species is based on the subjective observations of the authors. Rare: 1 or 2 encounters; Common: 2-9 encounters; Abundant: 10 or more observations.

## Taxonomic Checklist

*Acarospora elevata* H. Magn. 3031.1 On granite on east-facing slope. Rare.
*Acarospora obnubila* H. Magn. 3031.2 On granite. Rare.
*Acarospora socialis* H. Magn. 2633 On granite. Abundant.
*Acarospora strigata* (Nyl.) Jatta 2603, 2612, 2638 On granite. Abundant.
*Aspicilia desertorum* (Kremp.) Mereschk. On granite. Abundant. Observed.
*Bacidia species* 2519.2 Rare on granite. Under study.
*Buellia alboatrum* (Hoffm.) Flotow 2519.1 On granite. Rare.
*Buellia dispersa* A. Massal. 2620 On granite. Abundant.
*Buellia sequax* (Nyl.) Zahlbr. 3040 On granite. Common.
*Buellia spuria* (Schaerer) Anzi 2596.2 On granite. Rare.
*Caloplaca crenulatella* (Nyl.) Oliv. 3039 On granite in wash. Rare.
*Caloplaca decipiens* (Arnold) Blomb. & Forss. 3020 On granite. Rare.
*Caloplaca marmorata* (Bagl.) Jatta On soft granite in wash. Rare.
*Caloplaca nashii* Nav.-Ros. 3021, 3035 On soft granite in washes. Abundant.
*Caloplaca pellodella* (Nyl. in Hasse) Hasse 3026 On soft granite. Common.
*Candelariella aurella* (Hoffm.) Zahlbr. 2610 On soft granite along washes. Rare.
*Candelariella rosulans* (Müll Arg.) Zahlbr. 2596.1 On granite. Abundant.
*Collema coccophorum* Tuck. 3038 On soil and soil over rock. Abundant.
*Dermatocarpon americanum* Vain. 3027 On granite. Abundant.
*Diploschistes actinostomus* (Ach.) Zahlbr. 3029 On granite in shade. Rare.
*Heppia* cf. *adglutinata* Soil. Rare. Observed and studied in one soil crust, collected as heavily infested host of a verrucariod lichenicole currently under study (# 2623).
*Lecania polycycla* (Anzi) Lettau 3032.1 On granite in washes. Common.
*Lecidea* sp. 2631 On granite. Rare. Under study
*Lecidea laboriosa* Müll Arg. 2603 On granite. Common.
*Lecidella carpathica* Körber 3011 On granite. Rare.
*Lepraria* sp. 2625 Over granite in shade. Rare. Under study.
*Lichinella nigritella* (Lett.) Moreno & Egea 3034 On granite. Rare.
*Lobothallia alphoplaca* (Wahlenb. ex Ach.) Hafellner 2611, 3022 On granite. Abundant.

*Melanohalea elegantula* (Zahlbr.) O. Blanco, A. Crespo, Divakar, Essl., D. Hawksw. & Lumbsch 2634 On shaded granite vertical. Rare.

*Miriquidica* sp. 3037 On granite. Common, sterile, making positive ID impossible.

*Phaeophyscia sciastra* (Ach.) Moberg 3019 On soft granite in washes. Abundant. Determined by Theodore L. Esslinger. This form, which is common throughout the southwestern Mojave at higher elevations, is highly reduced and under-developed.

*Physcia biziana* (A. Massal.) Zahlbr. 2592 On granite. Abundant.

*Placidium lacinulatum* (Ach.) Breuss var. lacinulatum 2618 On soil, alone or in crusts. Most specimens were sterile, expanding by division.

*Peltula euploca* (Ach.) Poelt 2616 On granite verticals flushed by storms. Common.

*Placopyrenium noxium* Breuss 2630 Key's Ranch. On Staurothele areolata. Rare.

*Polysporina lapponica* (Ach. *ex* Schaerer) Degel. 2602 On granite and other lichens. Common.

*Psora decipiens* (Hedwig.) Hoffm. 2617 Part of single soil crust. Rare.

*Psora tuckermanii* Timdal 2626 On granite. Abundant.

*Rhizocarpon geminatum* Körber 2615 On granite. Abundant.

*Sarcogyne privigna* (Ach.) A. Massal. 2622, 324. On granite. Abundant.

*Staurothele areolata* (Ach.) Lattau. 2621, 3032.2 On soft granite along washes. Common.

*Toninia sedifolia* (Scop.) Timdal 2627 On soil along washes. Rare.

*Verrucaria compacta* (A. Massal.) Jatta. 2600, 2629 On granite. Common.

*Xanthomendoza mendozae* (Räsanen) S. Kandratyuk & Kärnfelt 3036 On granite. Rare. Two sites along wash in shade.

*Xanthoparmelia mexicana* (Gyeln.) Hale 2608, 3039. On granite. Abundant. Determined by James C. Lendemer. Salazinic acid in low concentration in medulla.

*Xanthoparmelia cumberlandia* (Gyeln.) Hale 2626 On granite. Common.

*Xanthoria elegans* (Link) Th.Fr. 2624 On granite. Abundant.

**Conclusion --** Thirty-four genera and 47 species are reported, the majority of these occurring on rocks, the others on soil. There are several species (e.g. *Acarospora elevata, Melanohalea elegantula, Physcia biziana, Rhizocarpon geminatum, Xanthomendoza mendozae*) that are commonly associated with the higher elevation montane flora of the San Bernardino and San Jacinto Mountains (Knudsen *in press*). In addition, seven species (*Candelariella aurella*, *Caloplaca crenulatella*, *Caloplaca nashii*, *Lecania polycycla*, *Psora decipiens*, *Staurothele areolata*, *Toninia sedifolia*) that are commonly found on carbonate deposits in the San Bernardino Mountains (Knudsen in press), we collected at Key's Ranch on or near efflorescence deposits which are a result of evaporation near the edge of washes . No lichens were found on bark or wood.

This study shares at least 10 species with Doell's (1999) study of the Granite Mountains, California; however this number may actually be higher because some determinations in Doell's study are only to genus or appear to need clarification in light of new treatments. Our study shares at least nine species with both the Mojave National Preserve study (Knight et al 2002) and the Blackrock Arizona study (Jackson et al 2005). How much this flora differs from the other flora of the Mojave Desert should emerge more fully with several more surveys in the area. It is possible a slightly higher rainfall amount (8") is a main factor in a different species composition.

This is the first report of the stiptate *Acarospora obnubila* H. Magn. in the literature since H. Magnusson published it in 1929 based on a single specimen from Arizona. The identification is based on the holotype (UPS!) which disagrees with the protologue description and would have been impossible to key out. It occurs in Southern California, the southwestern edge of the Mojave Desert, and in Arizona in the mountains of Maricopa County; based on current collections, it is expected throughout southwestern North America. It will be treated in full in my treatment of the genus Acarospora in Vol. 3 of the Sonoran flora. *Lecania polycycla*, *Placopyrenium noxium* and *Verrucaria compacta* are reported new to California (Shirley Tucker. *pers. com.)* Collections made during this study and earlier collections made in the San Bernardino Mountains (Knudsen in press) and the Colorado Desert in Santa Rosa National Monument in Riverside County suggest they are relatively common in Southern California. Early collections of *P. noxium* and *V. compacta* were originally determined by Othmar Breuss.

At least two possible un-described species of *Lecidea* and *Bacidia* are being studied.

The interim assignment of *Lepraria* with leprose habit and atranorin to *Lepraria caesioalba,* instead of simply to genus, is probably the wrong approach (Tønsberg 2004). The leprose form (which can be morphological diverse in analysis) may be better understood in western North America as a convergent evolutionary form with differing chemistries pointing to different species. The *Lepraria* species we collected is currently under study too.

We plan to survey additional habitats and elevational ranges as well as geologically different areas within Joshua Tree National Park on the southwestern limit of the Mojave Desert. For our next study we will collect in open Joshua tree woodland. Initial sampling suggests some interesting differences between habitats.

**Acknowledgments** -- Special thanks to Othmar Breuss, Theodore L. Esslinger, James C. Lendemer, Nicole Pietrasiak, and Shirley Tucker.

## References

Barth, A.P., J.L. Wooden., D.S. Coleman, and L.J. Jarvis, 2004, Crust formation and evolution in southern California: Field and geochronologic perspectives from Joshua Tree National Park, in Eggers, M.R. (ed.), Mining History and Geology of Joshua Tree National Park: San Diego Association of Geologists, pp. 65-78.

Doell, J. 1999. Lichens of the Sweeney Granite Mountains Desert Research Center and environs. Bulletin of the California lichen Society 6: 8-12.

Holland, R. F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Nongame-Heritage Program. California Department of Fish & Game. Sacramento, CA. 156 pp.

Jackson, Heather Bird, Steven D. Leavitt, Thomas Krebs, Larry L. St. Clair. 2005. Lichen flora of the eastern Mojave Desert: Blackrock Arizona, Mojave County, Arizona, USA. Evansia 22: 30-38.

Knight, K.B., D.R. Clements, L.F. Gordillo, J.I. Jefferies, D. Tilley, T.J. Workman, A.F. Lloyd, and Larry L. St. Clair. 2002. The lichen flora of two sites in the Mojave Desert, California, USA. Mycotaxon 84: 27-32.

Knudsen, K. *in press.* The carbonate lichen flora of Cactus Flats in the San Bernardino Mountains, San Bernardino County, California, USA. Crossosoma, Vol. 30, No. 1. Magnusson, A. H. 1929 (1930). A monograph of the genus *Acarospora.* Kongl. Svenska Vetenskaps-Akademiens Handlingar, 7: 1-400

Nash III, T.H., B.D. Ryan, C. Gries, & F. Bungartz 2002. Lichen Flora of the Greater Sonoran Desert Region. Tempe: Arizona: Lichens Unlimited, Vol. 1, 532 pp. Nash III, T.H., B.D. Ryan, P. Diederich, C. Gries, & F. Bungartz 2004. Lichen Flora of the Greater Sonoran Desert Region. Tempe: Arizona: Lichens Unlimited, Vol. 2, 742 pp.

Rosentretter, R. and D.J. Eldridge. 2002. Monitoring, Biodiversity, and Ecosystems Function : Grasslands, Deserts, and Steppe *in* Nimis, P.I., C. Scheidegger & P.A.

Sawyer, J. O. and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society. Sacramento, CA. 471 pp.

Tønsberg, T. 2004 *Lepraria in* Lichen Flora of the Greater Sonoran Desert Region, Vol. 2, pp. 322-329.

Wolsley. *Monitoring with Lichens - Monitoring Lichens*. Nato Science Series. IV. Earth and Environmental Sciences. Dordrecht, The Netherlands: Kluwer Academic Publishers, pp. 223-237.

# Additions to the Lichen Flora of Alabama I.

Curtis J. Hansen[1] and Roland R. Dute[2]

**Abstract** -- Seventy-nine additional lichens and lichenicolous fungi are reported from Alabama, including 44 species new for the state and another 35 new county records.

**Introduction** -- This report is in continuation of the publication of "A Catalog and Brief History of the Lichen Flora of Alabama" (Hansen 2003)[†] and includes 79 additional reports from further literature reviews, inquiries to individuals, and visits to other herbaria. In particular, personal visits were made to FH, NY, and US to search their collections for new records from Alabama. Searches at these herbaria revealed several unreported lichen species; however, due to time constraints complete searches of these collections were not possible. Future visits will undoubtedly result in additional new reports for Alabama. Based on these additions, we have documented a total of 182 genera, 605 species, 11 varieties, and 5 subspecies of lichens and lichenolicolous fungi for the state of Alabama.

Several records were generously provided by R. C. Harris and W. R. Buck from their personal field work done in Alabama. Likewise, B. E. Wachholder kindly provided an unpublished list of lichens from research work at Weeks Bay National Estuarine Research Reserve in Baldwin County, Alabama (see Methven *et al.*). Each entry lists the species followed by county, collector, herbarium and/or literature report. Bold-faced entries are new species reports or records for the state, and the remaining entries document previously unreported county records.

**Additions** --

ACAROSPORA CERVINA A. Massal. (Lawrence Co.: *Peters 2-21*, UNA-Peters as *Parmelia cervina*)

ANTHRACOTHECIUM STAUROSPORUM (Tuck. *ex* Willey) Zahlbr. (Cleburne Co.: *Harris 1428*, MSC)

---

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ARTHONIA COMPENSATA Nyl. *ex* Willey (Baldwin Co.: *Evans 376*, NY)

ARTHOTHELIUM INTERVENIENS (Nyl.) Zahlbr. (Monroe Co.: *Buck 44849*, NY; Baldwin Co.: *Evans 278*, NY; Escambia Co.: *Johnson s.n.*, NY)

BUELLIA CURTISII (Tuck.) Imshaug (Tuscaloosa Co.: *Ryan 29277*, ASU as *Baculifera curtisii*)

BUELLIA MAMILLANA (Tuck.) W. A. Weber (Monroe Co.: *Buck 44869*, NY)

BYSSOLOMA MEADII (Tuck.) S. S. Ekman (Monroe Co.: *Buck 44859*, NY)

BYSSOLOMA SUBDISCORDANS (Nyl.) P. James (Alabama, Fish River, *Evans 321*, UPS, Santesson 1952 as *B. rotuliforme*)

CALOPLACA EPIPHORA (Tayl.) Dodge (Baldwin Co.: *Evans 57*, NY, Wetmore 2004a)

CALOPLACA GRANULARIS (Müll. Arg.) Zahlbr. (Covington Co.: *Egan 4944*, MIN; Mobile Co.:*Tucker 7176*, LSU, Wetmore 2004b)

CANDELARIELLA EFFLORESCENS R. C. Harris & W. R. Buck (Baldwin Co.: *Evans s.n.*, MIN)

CANOMACULINA HAITIENSIS (Hale) Elix (Fayette Co.: *Hale 34033*, US)

CLADONIA BOTRYOCARPA G. Merr. (Baldwin Co.: *Evans 161*, FH)

CLADONIA DEFORMIS (L.) Hoffm. (Marshall Co.: *Hubricht B1537*, FH)

CLADONIA GRACILIS (L.) Willd. (Winston Co.: *Peters 2-49*, UNA-Peters)

CLADONIA GRAYI G. Merr. *ex* Sandst. (Clarke Co.: *Buck 44817*, NY)

CLADONIA PEZIZIFORMIS (With.) J. R. Laundon (Clarke Co.: *Buck 44836*, NY)

CLADONIA POLYCARPOIDES Nyl. (Monroe Co.: *Buck 44888*, NY)

CLADONIA PYCNOCLADA (Gaudich.) Nyl. (Baldwin Co.: *Evans 178*, NY)

COCCOCARPIA PALMICOLA (Spreng.) Arv. & D. J. Galloway (Clarke Co.: *Buck 44830*, NY)

COLLEMA PULCELLUM Ach. var. LEUCOPEPLUM (Tuck.) Degel. (Baldwin Co.: *Evans 238*, FH as *Collema leucopepla* Tuck.)

ENTEROGRAPHA ANGUINELLA (Nyl.) Redinger (Baldwin Co.: *Evans s.n.*, NY, Sparrius 2004)

GASSICURTIA ELIZAE (Tuck.) Marbach (Clarke Co.: *Buck 44787*, NY as *Buellia elizae*)

GRAPHINA COLUMBINA (Tuck.) M. Wirth & Hale (Monroe Co.: *Buck 44871*, NY as *Fissurina columbina*)

GRAPHINA SUBNITIDULA (Nyl.) Zahlbr. (Clarke Co.: *Buck 44802*, NY as *Fissurina subnitidula*)

GRAPHIS AFZELII Ach. (Baldwin Co.: *Evans 24*, NY; Covington Co.: *Johnson s.n.*, NY)

GRAPHIS CAESIELLA Vainio (Baldwin Co.: Brent Wachholder, pers. comm., see Methven *et al. in prep.*)

GRAPHIS INSIDIOSA (C. Knight & Mitten) Hook. f. (Clarke Co.: *Buck 44806*, NY as *Fissurina insidiosa)*

GYALECTA FARLOWII Tuck. *ex* Nyl. (--Blount Co.: *Dey 18290*, NY as *Petractis farlowii*)

GYALECTIDIUM FILICINUM Müll. Arg. (Clarke Co.: *Buck 44832*, NY)

HAEMATOMMA ACCOLENS (Stirton) Hillm. (Chilton Co.: *Pollard & Maxon 284*, FH, Staiger & Kalb 1995)

HAEMATOMMA FLEXUOSUM Hillm. (Baldwin Co.: *Evans 128, 396*, FH, Staiger & Kalb 1995)

HAEMATOMMA PERSOONII (Fée) A. Massal. (Baldwin Co.: *Evans 18*, FH, Staiger & Kalb 1995)

HAEMATOMMA RUFIDULUM (Fée) A. Massal. (Houston Co.: *Pursell 3916a*, GZU, Staiger & Kalb 1995)

HETERODERMIA ALBICANS (Pers.) Swinscow & Krog (Monroe Co.: *Buck 44878*, NY)

HYPOTRACHYNA LIVIDA (Taylor) Hale (Monroe Co.: *Buck 44863*, NY)

LECANORA CAESIORUBELLA Ach. ssp. PROLIFERA (Fink) R. C. Harris (Clarke Co.: *Buck 44793*, NY)

LECANORA CARPINEA (L.) Vainio (Baldwin Co.: *Evans 4*, FH)

LECANORA PULICARIS (Pers.) Ach. (Baldwin Co.: *Evans 114*, FH; Chilton Co.: *Pollard 282*, FH; Madison Co.: *Pollard 403*, FH)

LECANORA SYMMICTA (Ach.) Ach. (Baldwin Co.: *Evans 162*, NY)

LECIDEA FLORIDENSIS Nyl. (Monroe Co.: *Buck 44868*, NY)

LEPTOGIUM AZUREUM (Sw.) Mont. (Clarke Co.: *Buck 44812*, *44825*, NY)

LEPTOGIUM CYANESCENS (Rabenh.) Körber (Clarke Co.: *Buck 44825A*, NY; Monroe Co.: *Buck 44876*, NY)

LEPTOGIUM SATURNINUM (Dickson) Nyl. (Alabama, *Peters 3-61a*; UNA-Peters as *Collema saturinum*)

LETROUITIA VULPINA (Tuck.) Hafellner & Bellem. (Clarke Co.: *Buck 44845*, NY)

LOBARIA TENUIS Vainio (Baldwin Co.: Brent Wachholder, pers. comm., see Methven *et al. in prep.*)

MINUTOEXCIPULA TUCKERAE V. Atienza & D. Hawksw. [lichenicolous fungus] (Blount Co.: *Bowers 15998*, SBBG, Diederich 2003)

MYCOBILIMBIA LURIDA (Ach.) Hafellner (Alabama, *Peters 2-23a*, UNA-Peters)

MYCOCALICIUM FUSCIPES (Tuck.) Fink (Alabama, *Anon.*, FH as *Calicium fuscipes*)

MYRIOTREMA SUBCOMPUNCTUM (Nyl.) Hale (Clarke Co.: *Buck 44824*, NY)

NADVORNIKIA SOREDIATA R. C. Harris (Monroe Co.: *Buck 44873*, NY)

OCELLULARIA AMERICANA Hale (Baldwin Co.: *Evans 463*, FH)

OCELLULARIA SANFORDIANA (Zahlbr.) Hale (Baldwin Co.: *Evans 117*, NY)

OPEGRAPHA ATRA Pers. (Baldwin Co.: *Evans 414*, NY)

PARMELIA SULCATA Taylor (Marshall Co.: *Couch 4*, JSU)

PARMOTREMA GARDNERI (C. W. Dodge) Sérus. (Tuscaloosa Co.: *Schallert 2039*, US; Baldwin Co.: *Evans 365*, US)

PARMOTREMA MARGARITATUM (Hue) Hale (Bibb Co.: *Hale 33822*, US; Tallapoosa Co.: *Hale 1042*, US; Dekalb Co.: *Hale 7047*, US)

PARMOTREMA PERFORATUM (Jacq.) Mass. (Monroe Co.: *Buck 44856*, NY)

PARMOTREMA SUBMARGINALE (Michx.) DePriest & B. Hale (Clarke Co.: *Buck 44808*, *44829*, NY; Monroe Co. *Buck 44877*, NY)

PELTIGERA HYMENINA (Ach.) Delise (Lee Co.: *Earle & Baker s.n.*, NY)

PERTUSARIA SINUSMEXICANI Dibben (Clarke Co.: *Buck 44826*, NY)

PHAEOGRAPHIS ERUMPENS (Ach.) Müll. Arg. (Baldwin Co.: *Evans 338*, NY)

PHAEOPHYSCIA RUBROPULCHRA (Degel.) Essl. (Monroe Co.: *Buck 44880*, NY)

PHLYCTIDIA LUDOVICIENSIS Müll. Arg. (Clarke Co.: *Buck 44795*, NY as *Phlyctis ludoviciensis*)

PHYLLOPSORA CONFUSA Swinscow & Krog (Monroe Co.: *Buck 44881, 44882*, NY)

PHYLLOPSORA CORALLINA (Eschw.) Müll. Arg. var. CORALLINA (Clarke Co.: *Buck 44797, 44842*, NY)

PHYSCIA ATROSTRIATA Moberg (Clarke Co.: *Buck 44791*, NY)

PYRENULA CONFOEDERATA R. C. Harris (Clarke Co.: *Buck 44805*, NY)

SARCOGYNE CLAVUS (DC.) Kremp. (Tallapoosa Co., Magnusson 1934)

SCLEROPHYTON INSCRIPTUM (Nyl.) Müll. Arg. (Clarke Co.: *Buck 44796*, NY)

THELIDIUM MINUTULUM Körber (Monroe Co.: *Buck 44858*, NY)

THELOTREMA ADJECTCUM Nyl. (Monroe Co.: *Buck 44865*, NY)

THELOTREMA SUBTILE Tuck. (--Clarke Co.: *Buck 44837*, NY)

TRAPELIA COARCTATA (Turner *ex* Sm. & Sow.) M. Choisy (Monroe Co.: *Buck 44883*, NY; Baldwin Co.: *Evans 312*, NY; Lee Co.: *Earle & Baker s.n.*, NY)

TREMELLA PERTUSARIAE Diederich [lichenicolous fungus] (Baldwin Co.:*Evans s.n.*, NY, Diederich 2003)

TRYPETHELIUM AENEUM (Eschw.) Zahlbr. (Baldwin Co.: Brent Wachholder, pers. comm., see Methven *et al. in prep.*)

TRYPETHELIUM VIRENS Tuck. *ex* Michener (Monroe Co.: *Buck 44861*, NY)

USNEA STRIGOSA (Ach.) A. Eat. (Clarke Co.: *Buck 44810* (psoromic acid strain), NY; Monroe Co.: *Buck 44887* (norstictic acid strain), NY)

VOUAUXIELLA LICHENICOLA (Linds.) Petr. & Syd. [lichenicolous fungus] (Marion Co.: *Harris 43446-A*, NY, Diederich 2003)

†. Authorship originally published incorrectly as "Hansen & Freeman," please see correction in Esslinger 2004.

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## References

Diederich, P. 2003. New species and new records of American lichenicolous fungi [Neue Arten und neue Funde von amerkanischen lichenicolen Pilzen]. Herzogia 16: 41-90.

Esslinger, T. L. 2004. Recent literature on lichens —193. The Bryologist 107: 250-261.

Hansen, C. J. 2003. A catalog and brief history of the lichen flora of Alabama. Evansia 20: 59-101.

Magnusson, A. H. 1934. On the species of *Biatorella* and *Sarcogyne* in America. Ann. Crypt. Exot. 7: 115-146.

Methven, A. S, B. E. Wachholder & C. L. Pederson. A checklist of corticolous lichens of Weeks Bay National Estuarine Research Reserve. (*in prep.*)

Santesson, R. 1952. Foliicolous lichens I, a revision of the taxonomy of the obligately foliicolous, lichenized fungi. Symb. Bot. Upsal. 12: 1-590.

Sparrius, L. B. 2004: A monograph of *Enterographa* and *Sclerophyton*. Biblioth. Lich. 89: 1-141.

Staiger, B. & K. Kalb. 1995. *Haematomma*-studien. I. Die Flechtengattung *Haematomma*. Biblioth. Lich. 59: 1-198.

Wetmore, C. M. 2004a. The isidiate corticolous *Caloplaca* species in North and Central America. The Bryologist 107: 284-292.

Wetmore, C. M. 2004b. The sorediate corticolous species of *Caloplaca* in North and Central America. The Bryologist 107: 505-520.

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- Effective with issue 22 (1) the senior author of each paper published in Evansia receives an electronic copy of their paper as a pdf file.

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The aim of *Evansia* is to provide a vehicle for the presentation and exchange of useful information on North American bryophytes and lichens. Articles are frequently popular in nature rather than technical and are intended to teach and inform both amateurs and professionals. The articles include, but are not restricted to, announcements of and reports on forays and meetings, presentations of techniques and aids for studying and curating lichens and bryophytes, and reports on local floras. Checklists and papers documenting new regional, state, or county records must include voucher specimens (collector and collection numbers) and an indication of where the specimens are deposited or a literature reference. Occasionally, articles of broad interest from locations other than North America may be included.

*Evansia* is published with the aid of desktop publishing software. Manuscripts should be submitted as Microsoft Word documents (Time New Roman, size 10 font) attached to an email and sent directly to the editor.

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# EVANSIA

Volume 22 Number 4

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**A Newly Designed Dissection Needle for Making Transverse Leaf Sections**
Kenneth Kellman 118

**A Visual Basic Macro, which Enables the Use of Microsoft® Excel for Dichotomous Keys**
Stephen J. Washburn 122

**Corrections and Additions to the North Carolina, USA Lichen Checklist**
Gary B. Perlmutter and Douglas N. Greene 126

**Epiphytic Macrolichens of the Greater Cincinnati Metropolitan Area – Part I: Species Lists and New County Records**
Stephen J. Washburn 138

**Seeking Funding Opportunities for Bryophyte and Lichen Inventories**
James R. Shevock 150

**Announcement Board**
Attention: Reminder about changes to Evansia 153

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Editors note:

- "Announcement Board". Please submit information about Bryological or Lichenological field trips, seminars, or meetings. Please include dates, locations and contact information. Deadlines for announcements will be March 1st (issue 1), June 1st (issue 2), September 1st (issue 3), and December 1st (issue 4).

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# A Newly Designed Dissection Needle for Making Transverse Leaf Sections

Kenneth Kellman[1]

**Abstract** -- The importance of transverse leaf sections in moss taxonomy is briefly discussed. A description of the rolling needle method for making transverse leaf sections is given. An improved dissecting needle is described with instructions on how to make one from easily obtained materials.

**Keywords** -- transverse leaf section, dissection needle, rolling needle method

It is impossible to underestimate the importance of making good transverse leaf sections if one is serious about identifying mosses. The section can reveal information about papillosity, costal structure, leaf margin structure, laminal stratosity, the shape and structure of costal outgrowths, and the thickness to width ratio of the laminal cells. Costal structure alone will help in distinguishing members of many of the acrocarpous families including the Dicranaceae, Grimmiaceae, Pottiaceae, and the Bryaceae. The shape and height of papillae is of importance when identifying plants in the Orthotrichaceae, Grimmiaceae, and Pottiaceae. Although laminal stratosity can often be determined with the focusing knob on the compound microscope, on plants with dense papillae only the leaf section can give a definitive answer. The shape and exposure of the chlorocysts is critical in properly placing a plant in the various sections of the Sphagnaceae. I could go on and on.

In spite of this importance, it is remarkable how infrequently leaf sections are made by students. Certainly, this is because of the difficulty and time it takes to make the sections. If a student has inconsistent results, the payback for investing the time necessary to make the section may not materialize. Therefore, the student needs to develop the ability to consistently produce good leaf sections. There are many methods for making sections, but usually the beginner is taught only the method favored by his/her mentor. If that technique is difficult for them, the students may shy away from making the sections, and their work, accuracy and

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confidence will suffer. Therefore, I feel it is important for all bryologists to explain their favorite method of sectioning, so students can experiment and choose the method they prefer and have success with.

I was first taught the rolling needle method by Dan Norris in Berkeley. He attributes the technique to Harold Robinson, of the Smithsonian Museum. The basic idea of this procedure was to place the leaf on a microscope slide, and hold it down with a dissecting needle. A sharp razor blade is used to make a cut along the edge of the needle, using it as a guide. Then the needle is rolled back toward the remaining portion of the leaf and another cut is made. The process can be continued until one feels that a sufficient number of useful sections have been produced.

It may be the fastest method that I have heard of, but it is not necessarily an easy one. The most difficult aspect is the control of the needle tool. The most common mistake is that the needle is rolled too much, producing a section that is too thick. It is also important to control the pressure used to hold down the leaf so that the leaf is not torn or crushed.

To solve the first problem, I have designed an improved needle tool. All that is needed to make one is a large sewing needle and a piece of ½" wooden dowel, a drill with a 1/16" bit, a pair of wire cutters, a small piece of sandpaper or emery board, and a little elmer's glue or epoxy. The needle I have found most useful is 3" long and .004" (1mm) in diameter. The needles I buy are called soft sculpture doll needles, and are available in a pack of 6 (Dritz product # 56D) for about $1.29. The hardwood dowel is available at any hardware store. Cut a piece about 4 " long. Drill a 1/16" hole about ½ " deep near the center point of the end of the dowel. Do not worry too much about whether the hole is exactly in the middle of the end, or whether it is exactly straight. This is not critical. Use the wire cutters to cut approximately ½" from the eye end of the needle being careful to save this end with the eye. It tends to fly off into nowhere, so it is best to hold the whole needle in a rag or towel while the cut is made. Next dip the cut end of the long part of the needle into a drop of glue, and put it in the hole you drilled in the end of the dowel. Next wedge the eye end into the hole alongside the projecting needle. This holds the needle in place quite nicely. Don't worry if the needle is not precisely straight and parallel to the handle. You should have about 2" projecting from the end of the dowel. When the glue dries in about an hour, take the emery board or sandpaper and run it along the length of the needle. Rotate the needle a little bit and repeat until the needle has been roughened all the way around. Do not run the paper around the needle. What you are trying to create is a "tread" that actually grips the leaf as you roll it, so the microscopic grooves created by the sanding must run parallel to the length of the needle. That is all there is to it. You end up with a dissecting needle with a fat handle.

An alternative method might be to wrap tape or something else around the handle of a regular dissecting needle to increase the handle diameter. I have not experimented with this idea, and it seems that it would take a lot of tape. If you do try it, make sure that you still roughen the needle as described above.

The larger diameter of the handle makes it easier to hold the tool, and to control the amount of roll as you make leaf sections. Because the circumference of the handle is larger than the normal dissecting needle, it acts like a high gear ratio, and means that the same amount of roll (measured in distance around the handle circumference) translates into a smaller angular roll of the needle itself (compared to the same roll on a smaller diameter handle). ½" diameter seems to be the optimum, because a thicker handle would make it necessary to hold the tool at a higher angle from the slide. The longitudinal scratches on the needle itself help to grip the leaf as you roll the needle. I have found it occasionally necessary to re-roughen the needle surface to retain this feature.

To solve the second problem, I merely stack several leaves before I section them. This creates a "thick" pad. It is much easier to slice a thick object than a thinner one, and the pile makes the leaves less likely to crush or tear under the needle. Even better, each cut makes multiple sections, decreasing the amount of time needed to make enough sections to see the various structures you are trying to examine.

So here is the whole procedure. I take a stem and place it in a drop of water on the right hand side of a clean slide. Under a dissecting microscope I remove many leaves and let them float while I discard the stem. I then select the leaves I want to section and place the first one on the left hand side of the slide. When stacking the leaves, I do not put another drop of water on the stack, but just use the water that comes along with the leaves. This makes it possible to control the leaves as I stack them and it minimizes the tendency of the newly cut sections to float off and get lost. I then place the second leaf on top of the first so that they fit together like spoons. This is the hardest part of the whole process, but as I explained above, the advantages more than pay back the time invested. One trick is to select leaves of similar size and curvature. It is impossible to stack a leaf that curves to the left on top of one that curves to the right. I try to stack at least three leaves.

I then place the needle over the stack and lightly press down. Using a sharp blade make the first cut along the far side of the needle. I use a chopping type cut, not a sliding or slicing one. The full edge of the blade should hit the slide at one time. Use the blade to scrape the scrap leaf out of the way. Then roll the needle back toward you. This is a tiny, almost imperceptible roll. Make another cut, creating the first section. I repeat this tiny roll and chop procedure for many cuts. After I am satisfied that I have some good sections, I hold the razor blade on the slide and use an eyedropper to wash off any sections that have been stuck to the blade. Note that this is the first time I have added any water other than that which was on the leaves as I stacked them. I then use forceps to remove the remaining large leaf fragments. Put on a coverslip and you are done. I also put a coverslip over the remaining leaves on the right hand side of the slide. This way, I have one slide with both whole leaves and leaf sections, and I am ready to key.

The importance of a sharp blade cannot be underestimated. I use single edge blades that I buy in a pack of 100 at the hardware store. Other people like double edged blades that are broken in half. I don't think it matters. Use whatever blade works best for you. You will know immediately if the blade is not sharp when instead of cutting with a satisfying clicking noise, you get crushed sections. I have talked with other bryologists, who, in an effort to increase the longevity of the razor blade, make their sections on small wooden blocks. They then transfer the sections to a glass slide. I have never been able to get the sections cleanly onto the slide without breaking them, but they say that they have no problem. I also worry that there might be leftover sections on the block from the last plant that will confuse me as I look at sections from two different plants. To me the cost of a new blade every 4 or 5 plants is insignificant compared to the books, microscopes, and gas for collecting trips. I also keep used blades in a cup and use them around the house for scraping paint or opening packages.

Like all dissection techniques, this method takes some personal experimentation and practice. It is best to use larger leaves at first, as they are easiest to stack. Perserverance will result in a consistent production of high quality sections for a relatively short investment of time

# A Visual Basic Macro, which Enables the Use of Microsoft® Excel for Dichotomous Keys

Stephen J. Washburn[1]

**Abstract** -- An Excel© macro is used to display positive choices in a dichotomous key for printing a permanent record of a taxonomic determination.

**Keywords** -- Dichotomous Keys, Macro, Microsoft Excel, Visual Basic

**Introduction** -- In keying specimens it is sometimes prudent to save some kind of record of the decision thread leading to a taxonomic determination. This is particularly true for students learning a taxonomic group. It may also be helpful for the more experienced taxonomist, who might need a record of important character traits.

Whilst working with a collection of lichens I devised a simple Visual Basic macro, which would hide the unused choices of a dichotomous key. Using this macro I was then able to print a hard copy of the decision thread. This was very helpful, particularly after I sent my collection to an expert for verification or correction. When I went back to reconsider some of my erroneous taxonomic determinations I was able to refer to these records to better understand at what step or node in the key I had made my error.

**Methods** -- Prior to using the macro one must load a taxonomic key into Microsoft® Excel©, such that each separate choice is listed on a separate row of the spreadsheet. For example, I set up my keys to contain 4 columns: a Node, a Choice Description, a Decision, and a Destination (see Figure 1). Admittedly, this can be a lot of typing if an electronic version of the key is not available. I used Showman's & Flenniken's *Macrolichens of Ohio* (2004) as the source of the dichotomous key for this technique, for which I did not have an electronic version. Thus I did not load the entire key, but only those rows I found relevant to my specimens.

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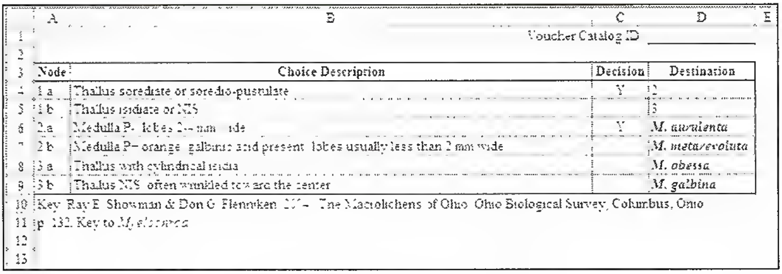


|  | A | B | C | D |
|---|---|---|---|---|
| 1 |  |  | Voucher Catalog ID |  |
| 2 |  |  |  |  |
| 3 | Node | Choice Description | Decision | Destination |
| 4 | 1 a | Thallus sorediate or soredio-pustulate | Y | 2 |
| 5 | 1 b | Thallus isidiate or NIS |  | 3 |
| 6 | 2 a | Medulla P- lobes 2-4 mm wide | Y | *M. aurulenta* |
| 7 | 2 b | Medulla P+ orange, galbinic acid present, lobes usually less than 2 mm wide |  | *M. metarevoluta* |
| 8 | 3 a | Thallus with cylindrical isidia |  | *M. obessa* |
| 9 | 3 b | Thallus NIS, often wrinkled towards the center |  | *M. galbina* |
| 10 | Key: Ray E. Showman & Don G. Flenniken 2004. The Macrolichens of Ohio. Ohio Biological Survey, Columbus, Ohio |  |  |  |
| 11 | p. 132. Key to *Myelochroa* |  |  |  |
| 12 |  |  |  |  |
| 13 |  |  |  |  |

Figure 1. Un-Collapsed Key

After loading the key into Excel© create the macro, and an optional macro button to run it. The following is the Visual Basic© code for this macro:

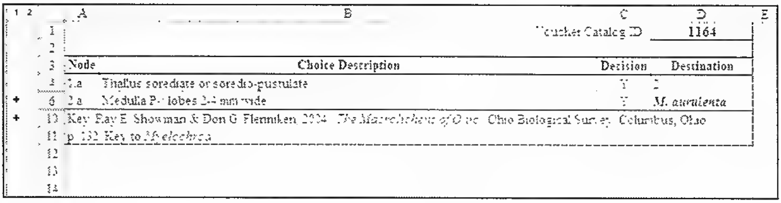
```
Sub Macro54()
' Collapse Key: Recorded 22 Jan 2005 by Stephen J. Washburn
Dim lngRowEnd As Long, lngRowCount As Long, VoucherNum As String
VoucherNum = InputBox("Enter voucher or accession number.", "Voucher Number")
Range("D1").Select
ActiveCell.Value = VoucherNum
Range("C4").Select
lngRowEnd = InputBox("Enter the last row number in key to consider", "Rows In Key - End")
lngRowCount = lngRowEnd - 3
For X = 1 To lngRowCount
   ActiveCell.Select
   If ActiveCell.Value = "" Then ActiveCell.EntireRow.Group
   ActiveCell.Offset(1, 0).Select
Next X
ActiveSheet.Outline.ShowLevels RowLevels:=1
Range("C4").Select
End Sub
```

The following are the steps to use the macro:

1. Answer the questions in the dichotomous key by placing a “Y” in the spreadsheet cell for each selected choice. Be sure to leave the rejected choices blank;
2. Click on the macro button to start the macro;
3. Answer the question referring to the accession number or voucher number of the specimen;

4. Answer the question referring to the ending row of the key. The macro will collapse the intervening unused choices; &
5. You may then print the resultant record of taxonomic determination.

Following the use of this macro, one is left with only a partial key visible (see Figure 2). Therefore a second macro was devised for restoring the key to its original format, so that it may then be used for the next specimen.



Voucher Catalog ID 1164

| Node | Choice Description | Decision | Destination |
|---|---|---|---|
| 1.a | Thallus sorediate or soredio-pustulate | Y | 2 |
| 2.a | Medulla P- lobes 2-4 mm wide | Y | *M. aurulenta* |

Key: Ray E. Showman & Don G. Flenniken 2004 *The Macrolichens of Ohio*. Ohio Biological Survey, Columbus, Ohio
p. 132 Key to *Myelochroa*

Figure 2. Collapsed Key

```
Sub Macro55()
' Un-collapse Key: Recorded 22 Jan 2005 by Stephen J. Washburn
Range("C4").Select
Selection.CurrentRegion.Select
Selection.Rows.Ungroup
Selection.EntireRow.Hidden = False
Range("C4").Select
End Sub
```

**Conclusions** -- This technique is rather adaptable and could be made to serve for virtually any key. I would be glad to assist those interested in using it, or discuss further developments.

## References

Microsoft® Excel 2003© 11.6355.6408 SP-1, Microsoft Corporation, Redmond, WA 98052

Microsoft® Visual Basic© 6.4.9972, Microsoft Corporation, Redmond, WA 98052

Showman, Ray E., and Don G. Flenniken. 2004. *The Macrolichens of Ohio*. Bulletin of the Ohio Biological Survey, New Series, Volume 14, Number 3. Ohio Biological

# Corrections and Additions to the North Carolina, USA Lichen Checklist

Gary B. Perlmutter[1] and Douglas N. Greene[2]

In response to the recently published North Carolina lichen checklist (Perlmutter 2005), a few errors were noticed and many citings of literature reports documenting additional taxa have been brought to our attention. Therefore, corrections to these errors and a supplemental checklist are here presented to clarify the checklist and make it more complete. An additional 128 lichen taxa are here reported for the state (Table 1) with two removed as not occurring in North America, bringing the total to 731.

**Corrections** -- Corrections to the checklist are listed below:

1. The Global Biodiversity Information Facility (GBIF) references were not fully cited. These are for three taxa: *Collema callibotrys, Pertusaria propinqua* and *P. rubefacta.* Their full citations are:

   *Collema callibotrys*: GBIF Data Portal, www.gbif.net. 2005-08-03. Collema callibotrys Tuck.; United States. GBIF-Sweden Provider, Lichens (S), 1 record from North Carolina.

   *Pertusaria propinqua*: GBIF Data Portal, www.gbif.net. 2005-08-03. Pertusaria propinqua Müll. Arg.; United States. International Institute for Sustainability (ASU) DiGIR Provider, Arizona State University Lichen Herbarium, 2 records from North Carolina.

   *Pertusaria rubefacta*: GBIF Data Portal, www.gbif.net. 2005-08-03. Pertusaria rubefacta Erichsen; United States. International Institute for Sustainability (ASU) DiGIR Provider, Arizona State University Lichen Herbarium, 1 record from North Carolina.

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2. *Lasallia pustulata*: "A very common lichen in Europe is most likely not found in North America." Brodo et al. (2001). This taxon should be excluded from the checklist.

3. *Lecanora varia*: Only *L. densa* and *L. laxa* occur in North America. *Lecanora varia* occurs in Europe, and therefore should be excluded from the checklist. See: Śliwa and Wetmore (2000) for descriptions and the keys to North American species.

4. *Parmotrema rigidum* (Lynge) Hale is now *P. subrigidum* Egan, a new species distinct from *P. rigidum* from South America (Egan et al. 2005).

5. *Pertusaria globularis* is cited from unpublished material; the citation should be Dibben (1980).

6. *Umbilicaria phaea* Tuck. has not been reported east of Nebraska (Llano 1950, Brodo et al. 2001). Therefore, this taxon should be excluded from the list as it is likely a misidentification.

7. Lendemer and Yahr (2004) is partially cited. The full citation is:

   Lendemer, J.C. and R. Yahr. 2004. A Checklist of the lichens collected during the Tuckerman Workshop #12, Outer Banks, North Carolina, USA. Evansia 21(3): 247-256.

8. *Usnea ambyloclada* (Müll. Arg.) Zahlbr. is *U. ambyloclada* Clerc & Herrera-Campos (Clerc & Herrera-Campos 1997)

9. *Usnea hesperina* Motyka is a synonym for *U. schadenbergiana* Göpp & Stein (Clerc 2004).

**Acknowledgements** -- We would like to thank the following for bringing these corrections and additional references to our attention: Philippe Clerc, Jonathan P. Dey, James C. Lendemer, and Tor Tønsberg. Carol Ann McCormick of the University of North Carolina Herbarium (NCU) provided some of these materials. This report in part meets the Final Project requirement of the North Carolina Botanical Garden Native Plant Studies certificate program for G.B. Perlmutter.

**Table 1.** Supplemental lichen taxa reported in the literature not listed in Perlmutter (2005). All taxa follow accepted nomenclature of Esslinger [1997 (updated 14 June 2005)] with synonyms as found in the literature. References are as first reported in the literature.

| **Taxon** | **Reference** |
|---|---|
| *Alectoria sarmentosa* (Ach.) Ach. subsp. *sarmentosa* | Degelius 1941 |
| *Anisomeridium polypori* (Ellis & Everh.) M.E. Barr (Syn.: *Arthopyrenia willeyana*) | Harris 1973 |
| *Anisomeridium subprostans* (Nyl.) R.C. Harris (Syn.: *Arthopyrenia* cf. *subprostans*) | Degelius 1941 |
| *Arthonia biseptata* Degel. | Degelius 1941 |
| *Arthonia spadicea* Leighton | Schmitt and Slack 1990 |
| *Arthopyrenia degelii* R.C. Harris | Harris 1995 |
| *Bacidia diffracta* S. Eckman | Ekman 1996 |
| *Bacidia sufffusa* (Fr.) A. Schnieder | Ekman 1996 |
| *Bacidina arnoldiana* (Körber) S. Ekman | Ekman 1996 |
| *Biatora appalachensis* Printzen & Tønsberg | Printzen & Tønsberg 2004 |
| *Biatora helvola* Körber ex Hellbom (Syn.: *Lecidea helvola*) | Degelius 1941 |
| *Biatora longispora* (Degel.) Lendemer & Printzen | Printzen & Tønsberg 2004 |
| *Biatora pycnidiata* Printzen & Tønsberg | Printzen & Tønsberg 2004 |
| *Bryoria furcellata* (Fr.) Brodo & D. Hawksw. (Syn.: *Alectoria nidulifera*) | Culberson 1958 |
| *Buellia mamillana* (Tuck.) W. A. Weber (Syn.: *Rinodina thomae*) | Fink 1935 |
| *Caloplaca camptida* (Tuck.) Zalbr. | Rudolph 1955 |
| *Caloplaca conversa* (Kremp.) Jatta | Wetmore 1994 |
| *Caloplaca pollinii* (A. Massal.) Jatta | Wetmore 1994 |
| *Caloplaca quercicola* H. Magn. | Rudolph 1955 |
| *Caloplaca sideritis* (Tuck.) Zahlbr. | Wetmore 1996 |
| *Caloplaca subsoluta* (Nyl.) Zahlbr. | Wetmore 2003 |
| *Caloplaca xanthostigmoidea* (Räsänen) Zahlbr. | Wetmore 2001 |
| *Cetrariella dilesei* (Bory ex Schaerer) Kärnefelt & Thell (Syn.: *Cetraria hiascens*) | Fink 1935 |
| *Chaenothecopsis pusilla* (Ach.) A.F.W. Schmidt | Sullivan 1996 |
| *Chrismofulvea dialyta* (Nyl.) Marbach (Syn.: *Buellia dialyta*) | Fink 1935 |
| *Cladonia perlomera* Kristinsson | Culberson and Kristinsson 1969 |
| *Cladonia petrophila* R.C. Harris | Harris 1992 |

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| **Taxon** | **Reference** |
|---|---|
| *Cladonia polycladodes* Nyl. | Evans 1947 |
| *Coenogonium pineti* (Ach.) ined. (Syn.: *Dimerella diluta, D. pineti, Microphiale diluta*) | Degelius 1941 |
| *Cresponea premnea* (Ach.) Egea & Torrente (Syn.: *Lecanactis premnea*) | Culberson 1972 |
| *Dendriscocaulon umhausense* (Auersw.) Degel. | Degelius 1941 |
| *Dermiscellum oulocheila* (Tuck.) Lendemer | Lendemer 2003 |
| *Diploschistes actinostomus* (Ach.) Zahlbr. | Fink 1935 |
| *Erioderma mollissimum* (Samp.) Du Reitz | Degelius 1941 |
| *Fuscidea arboricola* Coppins & Tønsberg | Tønsberg 1993 |
| *Fuscidea cyathoides* (Ach.) V. Wirth & Vezda (Syn.: *Lecidea rivulosa*) | Fink 1935 |
| *Fuscopannaria ahlneri* (P.M. Jørg) P.M. Jørg | Jørgensen 2000 |
| *Gassicurtia vernicoma* (Tuck.) Marbach (Syn.: *Buellia vernicoma*) | Imshaug 1951 |
| *Gomphillus calycioides* (Duby) Nyl. | Buck 1998 |
| *Graphis rigidula* Müll. Arg. | Lendemer and Yahr 2004 |
| *Hafellia parastata* (Nyl.) Kalb. (Syn.: *Buellia rinodinospora*) | Imshaug 1951 |
| *Heterodermia dendritica* (Pers.) Poelt | Culberson 1966 |
| *Hypotrachyna taylorensis* (M.E. Mitch.) Hale | Groner and Dietrich 1996 |
| *Lecanora albella* (Pers.) Ach. var. *albella* (Syn.: *L. pallida*) | Culberson 1958 |
| *Lecanora albellula* Nyl. (Syn.: *L. piniperda*) | Degelius 1941 |
| *Lecanora argentata* (Ach.) Malme | Brodo 1984 |
| *Lecanora chlarotera* Nyl. | Brodo 1984 |
| *Lecanora expallens* Ach. (Syn.: *L. conizaea*) | Degelius 1941 |
| *Lecanora hypoptoides* (Nyl.) Nyl. | Degelius 1941 |
| *Lecanora impudens* Degelius | Schmitt and Slack 1990 |
| *Lecanora imshaugii* Brodo | Brodo 1984 |
| *Lecanora insignis* Degel. | Degelius 1941 |
| *Lecanora miculata* Ach. | Brodo 1984 |
| *Lecanora pulicaris* (Pers.) Ach. (Syn.: *L. pinastri*) | Degelius 1941 |
| *Lecanora rugosella* Zahlbr. | Brodo 1984 |
| *Lecanora subimmergens* Vainio | Brodo 1984 |
| *Lecanora wisconsinensis* H. Magn. | Brodo 1984 |

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| **Taxon** | **Reference** |
|---|---|
| **Lecidea microps* Tuck. | Fink 1935 |
| *Lecidea micytho* Tuck. | Fink 1935 |
| *Lecidea nylanderi* (Anzi) Th. Fr. | Culberson 1958 |
| *Lecidea subtilis* Degel. | Degelius 1941 |
| *Lecidella elaeochroma* (Ach.) Haszl. (Syn.: *Lecidea olivacea*) | Degelius 1941 |
| *Leioderma cherokeense* P.M. Jørg. & Tønsberg | Jørgensen & Tønsberg 2005 |
| *Leptogium juniperinum* Tuck. | Sierk 1964 |
| *Leptorhaphis contorta* Degel. | Degelius 1941 |
| *Lithothelium hyalosporum* (Nyl.) Aptroot (Syn.: *Plagiocarpia hyalospora*) | Harris 1973 |
| *Lithothelium illotum* (Nyl.) Aptroot | Harris 1995 |
| *Lithothelium macrosporum* (R. C. Harris) Aptroot (Syn.: *Plagiocarpa macrocarpa*) | Harris 1989 |
| *Lithothelium phaeosporum* (R.C. Harris) Aproot | Harris 1989 |
| *Lithothelium septemseptatum* (R.C. Harris) Aproot) | Harris 1989 |
| *Loxospora cismonica* (Beltr.) Haffelner (Syn.: *Haematomma cismonicum*) | Fink 1935 |
| *Loxospora elatina* (Ach.) A. Massal. (Syn.: *Haematomma elatinum*) | Fink 1935 |
| *Megalaria albocincta* (Degel.) Tønsberg (Syn.: *Catinaria albocincta*) | Degelius 1941 |
| *Megalospora porphyritis* (Tuck.) R.C. Harris | Harris 1984 |
| *Megaspora verrucosa* (Tuck.) Sipman (Syn.: *Lecanora verrucosa*) | Fink 1935 |
| *Melanohalea olivacea* (L.) O. Blanco et al. (Syn.: *Parmelia olivacea*) | Degelius 1941 |
| **Melaspilea gemella* (Eshw.) Nyl. (Syn.: *Opegrapha scaphella* var. *gemella*) | Fink 1935 |
| *Micarea endocyanea* (Tuck. Ex Willey) R. C. Harris | Schmitt and Slack 1990 |
| *Melaspilea tribuloides* (Tuck.) Müll. Arg. | Fink 1935 |
| *Mycoporum compositum* (A. Massal.) R.C. Harris (Syn.: *M. ohiense*) | Fink 1935 |
| *Mycoporum pycnocarpoides* Müll. Arg. | Harris 1973 |

**Table 1.** Supplemental lichen taxa reported in the literature not listed in Perlmutter (2005). All taxa follow accepted nomenclature of Esslinger [1997 (updated 14 June 2005)] with synonyms as found in the literature. References are as first reported in the literature.

| **Taxon** | **Reference** |
|---|---|
| *Ochrolechia arborea* (Kreyer) Almb. | Brodo 1991 |
| *Ochrolechia mexicana* Vainio | Brodo 1991 |
| *Ochrolechia trochophora* var. *pruinirosella* Brodo | Brodo 1991 |
| *Ochrolechia tartarea* (L.) A. Massal. | Howard 1970 |
| *Pannaria lurida* subsp. *russellii* (Tuck.) P.M. Jørg | Jørgensen 2000 |
| *Pannaria subfusca* P.M. Jørg | Jørgensen 2000 |
| **Parmelia submarginalis* (Wulfen) Ach. | Fink 1935 |
| *Parmeliopsis ambigua* (Wulfen) Nyl. | Culberson 1958 |
| *Parmeliopsis hyperopta* (Ach.) Arnold | Culberson 1958 |
| *Parmotrema gardneri* (C. W. Dodge) Sérus. (Syn.: *Parmotrema robustum*) | Schmitt and Slack 1990 |
| *Pertusaria geminipara* (Th. Fr.) C. Knight ex Brodo (Syn.: *Ochrolechia geminipara*) | Howard 1970 |
| *Pertusaria multipunctoides* Dibben | Dibben 1980 |
| *Pertusaria sinusmexicani* Dibben | Dibben 1980 |
| *Pertusaria tetrathalamia* (Fée) Nyl. | Dibben 1980 |
| *Pertusaria waghornei* Hulting | Dibben 1980 |
| *Phaeographis erumpens* (Nyl.) Müll. Arg. | Fink 1935 |
| *Phylliscum demangeonii* (Moug. & Mont.) Nyl. | Yoshimura and Sharp 1968 |
| *Punctelia borreri* (Sm.) Krog | Schmitt and Slack 1990 |
| *Punctelia perreticulata* (Räsänen) G. Wilh. & Ladd | Aptroot 2003 |
| *Pyrenopsis subfuliginea* Nyl. | Degelius 1941 |
| *Pyrenula cuyabensis* (Malme) R.C. Harris | Harris 1989 |
| *Pyrenula laevigata* (Pers.) Arnold | Schmitt and Slack 1990 |
| *Pyrenula lucifera* R.C. Harris | Harris 1989 |
| *Pyrenula plittii* R. C. Harris | Schmitt and Slack 1990 |
| *Pyrenula punctella* (Nyl.) Trevisan | Harris 1989 |
| *Pyrenula subelliptica* (Tuck.) R.C. Harris (Syn.: *P. imperfecta*) | Harris 1973 |
| *Pyxine albovirens* (G. Meyer) Aproot | Amtoft 2002 |
| *Racodium rupestre* Pers. | Fink 1935 |
| *Rhizocarpon infernulum* (Nyl.) Lynge | Fryday 2002 |
| *Rhizocarpon rubescens* Th. Fr. (Syn.: *R.* | Degelius 1941 |

**Table 1.** Supplemental lichen taxa reported in the literature not listed in Perlmutter (2005). All taxa follow accepted nomenclature of Esslinger [1997 (updated 14 June 2005)] with synonyms as found in the literature. References are as first reported in the literature.

| **Taxon** | **Reference** |
|---|---|
| *plicatile*) | |
| *Rinodina chrysomelaena* Tuck. | Fink 1935 |
| **Rinodina dolichospora* Malme | Sheard and Mayehofer 2002 |
| *Rinodina subminuta* H. Magn. | Schmitt and Slack 1990 |
| *Rinodina willeyii* Sheard & Giralt | Sheard 1995 |
| *Ropalospora chlorantha* (Tuck.) S. Ekman (Syn.: *Bacidia chlorantha*) | Degelius 1941 |
| *Santessoniella crossophylla* (Nyl.) P.M. Jørg | Jørgensen 2000 |
| *Sticta sylvatica* (Hudson) Ach. | Fink 1935 |
| *Thelenella muscorum* (Fries) Vainio var. *muscorum* | Harris 1995 |
| *Thelomma carolinianum* (Tuck.) Tibell (Syn.: *Cyphelium carolinianum*) | Fink 1935 |
| *Trapeliopsis viridescens* (Schraader) Coppins & P. James | Sullivan 1996 |
| *Trichothelium chloroticum* (Ach.) R.C. Harris (Syn.: *Porina chlorotica*) | Fink 1935 |
| *Trichothelium guentheri* (Flotow) R.C. Harris | Harris 1995 |
| *Usnea cavarnosa* Tuck. | Degelius 1941 |
| *Usnea entoviolata* Motyka | Clerc 2004 |
| *Usnea halei* Clerc | Clerc & Herrera-Campos 1997 |
| *Usnea praetervisa* (Asahina) P.Clerc | Clerc 2004 |
| *Usnea silesiaca* Motyka (Syn.: *U. madiernensis*) | Clerc 1991 |
| *Xanthoparmelia hypomeleana* (Hale) Hale | Hale 1967 |
| **Total** | **129** |

*New to North America; not listed in Esslinger's checklist. Names were confirmed via Index Fungorum (CABI Bioscience et al. 2005).

## References

Amtoft, A. 2002. *Pyxine subcinerea* in the eastern United States. The Bryologist 105(2): 270-272.

Aptroot, A. 2003. A new perspective on the sorediate *Punctelia* (Parmeliaceae) species of North America. The Bryologist 106(2): 317-319.

Brodo, I.M. 1984. The North American species of the *Lecanora subfusca* group. Festschrift J. Poelt. Beiheft 79 zur Nova Hedwegia.

Brodo, I. M., Sharnoff, S. D. And Sharnoff, S. 2001. Lichens of North America. Yale University Press, New Haven, Connecticut.

Buck, W.R. 1998. Lichen flora of eastern North America: the genus *Gomphillus* (Gomphillaceae). Pp. 71-76 *in* Glenn, M.G., R.C. Harris, R. Dirig and M.S. Cole (eds.), Lichenographica Thompsoniana: North American lichenology in honor of John W. Thompson, Mycotaxon, Ltd., Ithaca, New York.

CABI Bioscience, CBS and Landcare Research. 2005. Index Fungorum, www.indexfungorum.org. Accessed August 2005.

Clerc, P. 1991. *Usnea madierensis* Motyka (Ascomycète lichénisé): une espèce méconne de l'Europe et de l'Amerérique du Nord. Condollea 46: 427-438.

---. 2004. Notes on the genus *Usnea* Adanson. II. Bibliotheca Lichenologica 88: 79-90.

--- and M. Herrera-Campos. 1997. Saxicolous species of *Usnea* subgenus *Usnea* (lichenized Ascomycetes) in North America. The Bryologist 100: 281-301.

Culberson, C.F. 1972. Additions to the phytochemistry of the lichen genus *Lecanactis*. The Bryologist 75(1): 43-47.

--- and H. Kristinsson. 1969. Studies on the *Cladonia chlorophea* group: a new species, a new meta-depside, and the identity of "novochlorophaeic acid." The Bryologist 72(4): 431-443.

Culberson, W.L. 1958. Variation in the pine-inhabiting vegetation of North Carolina. Ecology 39:23-28.

---. 1966. Chemistry and taxonomy of the lichen genera *Heterodermia* and *Anaptychia* in the Carolinas. The Bryologist 69: 472-487.

Degelius, G. 1941. Contributions to the lichen flora of North America II. The lichen flora of the Great Smoky Mountains. Arkiv för Botanik 30A(3): 1-80.

Dibben, M.J. 1980. The chemosystematics of the lichen genus *Pertusaria* in North America. Milwalkee Public Museum Publications in Biology and Geology 5: 1-162.

Egan, R.S., R. Harms and T. Widhelm. 2005. Studies on the lichen *Parmotrema rigidum s. lat.* from North and South America. The Bryologist 108(3): 402-405.

Ekman, S. 1993. A taxonomic study of *Ropalospora chlorantha*, and a comparison between *Ropalospora* and *Fuscidea*. The Bryologist 96(4): 582-591.

---. 1996. The corticolous and lignicolous species of *Bacidia* and *Bacidina* in North America. Opera Botanica 127: 1-148.

Esslinger, T.L. 1997. A cumulative checklist for the lichen-forming, lichenicolous and allied fungi of the continental United States and Canada. North Dakota State University: http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.html (First Posted 1 December 1997, Most Recent Update 14 June 2005), Fargo, North Dakota.

Evans, A.W. 1947. A study of certain North American Cladoniae. The Bryologist 50(1): 14-50.

Fink, B. 1935. The Lichen Flora of the United States. University of Michigan Press, Ann Arbor, MI. 426p.

Fryday, A.M. 2002. A revision of the species of the *Rhizocarpon hochstetteri* group occurring in British Isles. Lichenologist 34(6): 451-177.

Groner, U. and M. Dietrich. 1996. *Hypotrachyna taylorensis* (Parmeliaceae), an European species in the New World. The Bryologist 99(1): 457-459.

Hale, M. 1967. New taxa in *Cetraria*, *Parmelia*, and *Parmeliopsis*. The Bryologist 70(4): 414-422.

Harris, R.C. 1973. The corticolous pyrenolichens of the Great Lakes Region. The Michigan Botanist 12: 3-68.

---. 1984. *Megalospora porphyritis* in eastern North America. Evansia 1: 24.

---. 1989. A sketch of the family Pyrenulaceae (Melanommatales) in eastern North America. Mem. of the New York Bot. Gardens 49: 74-107.

---. 1992. *Cladonia petrophila*, a new species from eastern North America. Brittonia 44(3): 326-330.

---. 1995. More Florida Lichens, including the 10¢ tour of the pyrenolichens. Published by the author, Bronx, N.Y., 192 pp.

Howard, G.E. 1970. The lichen genus *Ochrolechia* in North America north of Mexico. The Bryologist 71(2): 93-130.

Imshaug, H.A. 1951. The lichen-forming species of the genus *Buellia* occurring in the United States and Canada [dissertation]. Ann Arbor, MI: University of Michigan; 217 pp.

Jørgensen, P.M. 2000. Survey of the lichen family Pannariaceae on the American continent, north of Mexico. The Bryologist 103(4): 670-704.

--- and T. Tønsberg. 2005. *Leioderma cherokeense* (Pannariaceae, Lecanorales) *sp. nov.* from the Great Smoky Mountains, North Carolina, U.S.A. The Bryologist 108(3): 412-414.

Lendemer, J.C. 2003. *Dermiscellum oulocheila*, forgotten priority and nomenclatural confusion in the Physciaceae (lichenized Ascomycetes). The Bryologist 106(2): 311-313.

--- and R. Yahr. 2004. Changes and additions to the checklist of North American lichens. II. Mycotaxon 90(2): 319-322.

Llano, G.A. 1950. A monograph of the lichen family Umbilicariaceae in the western hemisphere. Navexos p.831. Office of Naval Research, Washington, DC. 281 pp.

Perlmutter, G.B. 2005. Lichen checklist for North Carolina, USA. Evansia 22(2): 51-77.

Printzen, C. and T. Tønsberg. 2004. New and interesting *Biatora*-species, mainly from North America. Symb. Bot. Ups. 34(1): 343-357.

Rudolph, E.D. 1955. Revisionary studies in the lichen family Blasteniaceae in North America north of Mexico. Ph.D. dissertation, Washington University, UMI Dissertations. 220 pp.

Schmitt, C. K. And N. G. Slack. 1990: Host specificity of epiphytic lichens and bryophytes: a comparison of the Adirondack Mountains (New York) and the Southern BlueRidge Mountains (North Carolina). The Bryologist 93: 257-274.

Sheard, J.W. 1995. Disjunct distributions of some North American, corticolous, vegetatively reproducing *Rinodina* species (Physciaceae, lichenized scomycetes). Herzogia 11: 115-132.

--- and H. Mayehofer. 2002. New species of *Rinodina* (Physciaceae, lichenized Ascomycetes) from North America. The Bryologist 105(4): 645-672.

Sierk, H.A. 1964. The genus *Leptogium* in North America north of Mexico. The Bryologist 67(3): 245-317.

Śliwa, L. & C. M. Wetmore. 2000. Notes on the *Lecanora varia* group in North America. The Bryologist. 103(3) 475-492.

Sullivan, T.J. 1996. The lichens of Acadia National Park. A thesis submitted to the faculty of the graduate school of the University of Minnesota, Ph.D. UMI Dissertations. 243 pp.

Tønsberg, T. 1993. Additions to the lichen flora of North America II. The Bryologist 96(4): 629-630.

Wetmore, C.M. 1994. The lichen genus *Caloplaca* in North and Central America with brown or black apothecia. Mycologia 86(6): 813-838.

---. 1996. The *Caloplaca sideritis* group in North and Central America. The Bryologist 99(3): 292-314.

---. 2001. The *Caloplaca citrina* group in North and Central America. The Bryologist 104(1): 1-11.

---. 2003. The *Caloplaca squamosa* group in North and Central America. The Bryologist 106(1): 147-156.

Yoshimura, I. and A.J. Sharp. 1968. Some lichens from the southern Appalachians and Mexico. The Bryologist 71(2): 108-113.

# Epiphytic Macrolichens of the Greater Cincinnati Metropolitan Area – Part I: Species Lists and New County Records

Stephen J. Washburn[1]

**Abstract** --A total of 31 species of lichens were found in southwestern Ohio and northern Kentucky, including 19 new county records for Ohio and 4 new county records for Kentucky.

**Keywords** -- Lichens, Cincinnati, Ohio, Kentucky

**Introduction** -- Lichens throughout southwestern Ohio have not been surveyed for many years. The pioneer botanist E. Lucy Braun collected lichens in Kentucky and southwestern Ohio during the 1920's and 1930's. The imminent bryologist Margaret Fulford also made some collections of lichens from the 1930's through the 1960's. The lichen collections of both Braun and Fulford are deposited in the University of Cincinnati Herbarium (CINC). Taylor published his 2-volume *Lichens of Ohio* in the 1960's (Taylor, 1967 & 1968). It is out of print, and the nomenclature is out of date. Showman & Flenniken (2004) recently published a new macrolichen flora for Ohio with modern nomenclature, but had no recent collections from southwest Ohio to include.

Similarly, documentation of lichens in Kentucky remains outdated. Fulford (1938) reported on the Cladoniae in Eastern Kentucky, including Boone County. William L. Culberson also made collections from eastern Kentucky, including Boone County, during 1950 and 1951 (Culberson, 1951). His publication included citations of Braun's and Fulford's collections. Culberson's collections from this period are also deposited in CINC. Prescott (1951) collected lichens from some central Kentucky counties during 1950 and 1951 (*e.g.*, Jessamine, McCreary, Powell, etc.). In his thesis he published a list of 191 lichens for Kentucky (mostly macrolichens and some microlichens). His list includes his own collections and citations from Bruce Fink, Margaret Fulford, and others. Like Braun and Culberson, Prescott's list follows the nomenclature of Fink (1935). Prescott reported about 12 Cladoniae from Boone County, but no other

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taxa, and there is no indication in Prescott's thesis where his collections were deposited. Simpson (1978) also studied the lichens of the Bluegrass Region of Kentucky, but made no collections in Boone County. For the present study the corticolous macrolichens of southwestern Ohio and Boone County, Kentucky were surveyed from January 2003 to October 2004. Further research into the Kentucky lichen flora is warranted.

**Methods** -- The study area included four southwestern Ohio counties, and one county from northern Kentucky in the broad vicinity of Cincinnati, Ohio. The North-South range of the study area covered approximately 71 km (44 miles), and the East-West range covered about 77 km (47 miles). Sites were selected with the intention of sampling as broad a cross-section of local environments as possible, from the strictly urban to the rural, but not quite pristine. Initial reconnaissance into the local forest at some of these sites revealed a very restricted lichen flora, which was assumed to be due to poor light conditions under the forest canopy. As a consequence, the sampling venue was altered to consider trees in open areas, with no undergrowth. This led to a selection of 11 sites from two state parks, three county parks, three city parks, two cemeteries, and the holdings of one University.

Lichens were observed on the boles of the trees between 1 m and 1.5 m (3.3 and 4.9 feet) above the mean base. Although every attempt was made to field–identify the lichens, 200 vouchers were collected for confirmation or further identification in the laboratory. Vouchers were keyed using Showman & Flenniken (2004) and Brodo et al. (2000). Esslinger (1997) was consulted for current nomenclature. The vouchers were deposited in the personal herbarium of the author. The focus of this study was on macrolichens, inclusive of *Lepraria*. This led to the inadvertent collection of a few crustose lichens found on maple, such as *Lecanora strobilina*.

**Results** -- A list of the lichens observed at each site follows. Site location data and descriptions are provided individually. New county records are indicated by †.

**Big Bone Lick State Park**
Union, Boone County, Kentucky
38° 52.8994' N, 84° 44.6997' W, 210 m (668 feet) above mean sea level (AMSL)
Union USGS Topographic 7.5' Quadrangle

Big Bone Lick State Park contains 221.4 ha (547 acres) and is maintained by the Commonwealth of Kentucky. It is located in a rural setting, approximately 31.2 km (19.4 miles) southwest of the Cincinnati metropolitan center. The trees sampled here were located in the campground.

*Candelaria concolor* (Dickson) B. Stein
*Canoparmelia crozalsiana* (de Lesd. *ex* Harm.) Elix & Hale
*Flavoparmelia caperata* (L.) Hale
*Lepraria lobificans* Nyl.
*Myelochroa aurulenta* (Tuck.) Elix & Hale
*Parmotrema hypotropum* (Nyl.) Hale, [Washburn 1143, etc.] †
*Phæophyscia pusilloides* (Zahlbr.) Essl., [Washburn 1145]
*Phæophyscia rubropulchra* (Degel.) Essl., [Washburn 1148]
*Phæophyscia squarrosa* Kashiwadani (Moberg 1995), [Washburn 1149] †
*Physcia millegrana* Degel., [Washburn 1147]
*Physcia stellaris* (L.) Nyl.
*Punctelia bolliana* (Müll. Arg.) Krog, [Washburn 1149] †
*Punctelia rudecta* (Ach.) Krog
*Pyxine sorediata* (Ach.) Mont.
*Pyxine subcinerea* Stirton, [Washburn 1145, etc.] †

**Burnet Woods**
Cincinnati, Hamilton County, Ohio
39° 8.1938' N, 84° 31.0589' W, 233 m (764 feet) AMSL
Cincinnati West USGS Topographic 7.5' Quadrangle
Burnet Woods is a 36.1 ha (89.3 acre) park maintained by the City of Cincinnati Parks Department. It is located in an urban setting adjacent to the University of Cincinnati campus, approximately 3.9 km (2.4 miles) north of the metropolitan center. The trees observed here were located in open areas, adjacent to roadways (within 30 m).

*Candelaria concolor* (Dickson) B. Stein
*Canoparmelia crozalsiana* (de Lesd. *ex* Harm.) Elix & Hale
*Flavoparmelia caperata* (L.) Hale, [Washburn 1012]
*Lepraria lobificans* Nyl.
*Myelochroa galbina* (Ach.) Elix & Hale, [Washburn 1011]
*Phæophyscia rubropulchra* (Degel.) Essl., [Washburn 1014, etc.]
*Physcia millegrana* Degel.
*Pyxine subcinerea* Stirton, [Washburn 1013, etc.]

**East Fork State Park**
Batavia, Clermont County, Ohio
39° 2.1415' N, 84° 5.8429' W, 263 m (862 feet) AMSL
Williamsburg USGS Topographic 7.5' Quadrangle
East Fork State Park contains 1,970 ha (4,870 acres) and is maintained by the state of Ohio. It is located in a rural setting, approximately 39.7 km (24.7 miles) east by southeast of the metropolitan center. The trees observed here were located in the campground.

*Candelaria concolor* (Dickson) B. Stein
*Canoparmelia crozalsiana* (de Lesd. *ex* Harm.) Elix & Hale, [Washburn 1193, etc.]
*Flavoparmelia caperata* (L.) Hale
*Lecanora strobilina* (Sprengel) Kieffer
*Myelochroa aurulenta* (Tuck.) Elix & Hale, [Washburn 1175, etc.]
*Parmelia sulcata* Taylor, [Washburn 1181, etc.]
*Parmelinopsis minarum* (Vainio) Elix & Hale, [Washburn 1196] †
*Parmotrema austrosinense* (Zahlbr.) Hale, [Washburn 1182] †
*Parmotrema hypotropum* (Nyl.) Hale, [Washburn 1177, etc.]
*Phæophyscia pusilloides* (Zahlbr.) Essl., [Washburn 1188] †
*Phæophyscia rubropulchra* (Degel.) Essl.
*Physcia aipolia* (Ehrh. ex Humb.) Fürnr., [Washburn 1198] †
*Physcia millegrana* Degel.
*Physcia stellaris* (L.) Nyl., [Washburn 1195]
*Physconia detersa* (Nyl.) Poelt, [Washburn 1192] †
*Punctelia rudecta* (Ach.) Krog
*Punctelia subrudecta* (Nyl.) Krog / *P. perreticulata* (Räsänen) G. Wilh. & Ladd,[2] [Washburn 1180]
*Pyxine sorediata* (Ach.) Mont.
*Pyxine subcinerea* Stirton, [Washburn 1178, etc.]

**Harmon Park**
Lebanon, Warren County, Ohio
39° 25.8118' N, 84° 12.1717' W, 220 m (722 feet) AMSL
Lebanon USGS Topographic 7.5' Quadrangle
Harmon Park is a 4.5 ha (1.8 acre) park maintained by the City of Lebanon. It is located in an urban setting, approximately 49.1 km (30.5 miles)

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[2] See Aptroot, 2003

northeast of the metropolitan center. The trees observed here were located in the open area east of the tennis courts and north of the golf course.

*Candelaria concolor* (Dickson) B. Stein
*Canoparmelia crozalsiana* (de Lesd. *ex* Harm.) Elix & Hale
*Flavoparmelia caperata* (L.) Hale, [Washburn 1173]
*Lepraria lobificans* Nyl.
*Myelochroa aurulenta* (Tuck.) Elix & Hale, [Washburn 1171, etc.]
*Phæophyscia pusilloides* (Zahlbr.) Essl.
*Phæophyscia rubropulchra* (Degel.) Essl.
*Physcia millegrana* Degel.
*Physcia stellaris* (L.) Nyl.
*Punctelia bolliana* (Müll. Arg.) Krog, [Washburn 1174] †
*Punctelia rudecta* (Ach.) Krog
*Pyxine subcinerea* Stirton, [Washburn 1174]
*Xanthoria fulva* (Hoffm.) Poelt & Petutschnig, [Washburn 1170] †

**Miami University**
Oxford, Butler County, Ohio
39° 30.3244' N, 84° 43.4434' W, 255 m (835 feet) AMSL
Oxford USGS Topographic 7.5' Quadrangle
Miami University owns over 400 ha (1,000 acres) in its Natural Areas. The University is located in an urban setting, approximately 53 km (32.9 miles) northwest of the metropolitan center. The trees observed here were located on campus near parking lots, at Peffer Park, and at the WRA Cabin site, which is located in a rural farming area.

*Candelaria concolor* (Dickson) B. Stein
*Canoparmelia crozalsiana* (de Lesd. *ex* Harm.) Elix & Hale
*Flavoparmelia caperata* (L.) Hale
*Lepraria lobificans* Nyl.
*Myelochroa aurulenta* (Tuck.) Elix & Hale, [Washburn 1151, etc.]
*Phæophyscia cernohorskyi* (Nadv.) Essl., [Washburn 1157]
*Phæophyscia pusilloides* (Zahlbr.) Essl., [Washburn 1150, etc.]
*Phæophyscia rubropulchra* (Degel.) Essl., [Washburn 1160]
*Physcia americana* G. Merr., [Washburn 1164, etc.]
*Physcia millegrana* Degel., [Washburn 1153]
*Physconia detersa* (Nyl.) Poelt, [Washburn 1155, etc.]
*Physconia leucoleiptes* (Tuck.) Essl., [Washburn 1156, etc.] †
*Punctelia bolliana* (Müll. Arg.) Krog. [Washburn 1160] †

*Punctelia rudecta* (Ach.) Krog
*Punctelia subrudecta* (Nyl.) Krog / *P. perreticulata* (Räsänen) G. Wilh. & Ladd, [Washburn 1161] †
*Pyxine sorediata* (Ach.) Mont.
*Pyxine subcinerea* Stirton, [Washburn 1158]
*Xanthoria fulva* (Hoffm.) Poelt & Petutschnig, [Washburn 1152]

**Miami Whitewater Forest**
Harrison, Hamilton County, Ohio
39° 15.5303' N, 84° 44.6613' W, 174 m (572 feet) AMSL
Shandon USGS Topographic 7.5' Quadrangle
Miami Whitewater Forest is a 1,732 ha (4,279 acre) park, maintained by the Hamilton County Parks Department. It is located in a suburban/rural setting, approximately 27.2 km (16.9 miles) northwest of the metropolitan center. The trees observed here were located in the parking area adjacent to the visitor center.

*Candelaria concolor* (Dickson) B. Stein
*Canoparmelia crozalsiana* (de Lesd. *ex* Harm.) Elix & Hale, [Washburn 1081, etc.]
*Flavoparmelia caperata* (L.) Hale, [Washburn 1004]
*Myelochroa aurulenta* (Tuck.) Elix & Hale, [Washburn 1082, etc.]
*Parmelia sulcata* Taylor, [Washburn 1002] †
*Parmotrema austrosinense* (Zahlbr.) Hale, [Washburn 1092, etc.] †
*Parmotrema hypotropum* (Nyl.) Hale, [Washburn 1080, etc.]
*Phæophyscia pusilloides* (Zahlbr.) Essl., [Washburn 1083, etc.] †
*Physcia millegrana* Degel.
*Physcia stellaris* (L.) Nyl., [Washburn 1084, etc.]
*Punctelia rudecta* (Ach.) Krog
*Punctelia subrudecta* (Nyl.) Krog / *P. perreticulata* (Räsänen) G. Wilh. & Ladd, [Washburn 1105, etc.]
*Pyxine subcinerea* Stirton, [Washburn 1095, etc.]
*Rimelia reticulata* (Taylor) Hale & Fletcher, [Washburn 1120]
*Xanthoria fulva* (Hoffm.) Poelt & Petutschnig, [Washburn 1117]

**Millikin Woods**
Hamilton, Butler County, Ohio
39° 24.6882' N, 84° 35.5448' W, 209 m (687 feet) AMSL
Hamilton USGS Topographic 7.5' Quadrangle

Millikin Woods is a 29.5 ha (11.9 acre) park maintained by the City of Hamilton. It is located in an urban/suburban setting, approximately 38.2 km (23.7 miles) north by northwest of the metropolitan center. The trees observed here were scattered through the park within 300 m of Washington Blvd.

*Candelaria concolor* (Dickson) B. Stein
*Flavoparmelia caperata* (L.) Hale
*Lepraria lobificans* Nyl.
*Myelochroa aurulenta* (Tuck.) Elix & Hale
*Phæophyscia pusilloides* (Zahlbr.) Essl.
*Phæophyscia rubropulchra* (Degel.) Essl.
*Physcia millegrana* Degel., [Washburn 1125, etc.]
*Physcia stellaris* (L.) Nyl.
*Physconia detersa* (Nyl.) Poelt, [Washburn 1126]
*Punctelia rudecta* (Ach.) Krog, [Washburn 1124, etc.]
*Pyxine subcinerea* Stirton
*Xanthoria fulva* (Hoffm.) Poelt & Petutschnig, [Washburn 1127]

**Sharon Woods**
Cincinnati, Hamilton County, Ohio
39° 16.6072' N, 84° 24.5671' W, 183 m (600 feet) AMSL
Glendale USGS Topographic 7.5' Quadrangle
Sharon Woods is a 295.4 ha (730 acre) park maintained by the Hamilton County Parks Department. It is located in a suburban setting, approximately 21.7 km (13.5 miles) north by northeast of the metropolitan center. The trees observed here were adjacent to Lebanon Road (U.S. 42).

*Arthonia cæsia* (Flotow) Körber, [Washburn 1078]
*Candelaria concolor* (Dickson) B. Stein
*Canoparmelia crozalsiana* (de Lesd. *ex* Harm.) Elix & Hale, [Washburn 1056, etc.]
*Flavoparmelia caperata* (L.) Hale, [Washburn 1068]
*Myelochroa aurulenta* (Tuck.) Elix & Hale, [Washburn 1057, etc.]
*Parmotrema hypotropum* (Nyl.) Hale, [Washburn 1005]
*Phæophyscia rubropulchra* (Degel.) Essl., [Washburn 1070, etc.]
*Physcia millegrana* Degel., [Washburn 1071, etc.]
*Punctelia missouriensis* G. Wilh. & Ladd, [Washburn 1059] †
*Punctelia rudecta* (Ach.) Krog
*Pyxine sorediata* (Ach.) Mont., [Washburn 1055]

*Pyxine subcinerea* Stirton, [Washburn 1054, etc.]
*Rimelia reticulata* (Taylor) Hale & Fletcher, [Washburn 1073]
*Xanthoria fulva* (Hoffm.) Poelt & Petutschnig, [Washburn 1079]

**Shawnee Lookout**
Hamilton County, Ohio
39° 7.2497' N, 84° 48.3129' W, 172 m (565 feet) AMSL
Lawrenceburg USGS Topographic 7.5' Quadrangle
Shawnee Lookout is a 415.6 ha (1,027 acre) park overlooking the Ohio River, maintained by the Hamilton County Parks Department. It is located in a rural setting, approximately 26.1 km (16.2 miles) due west of the metropolitan center. The trees observed here were located on flat terrain elevated about 3 m (10 ft.) above a parking pad adjacent to the Columbia Terrace playground.

*Arthonia cæsia* (Flotow) Körber, [Washburn 1029] †
*Candelaria concolor* (Dickson) B. Stein, [Washburn 1053]
*Canoparmelia crozalsiana* (de Lesd. *ex* Harm.) Elix & Hale
*Flavoparmelia caperata* (L.) Hale, [Washburn 1017, etc.]
*Lepraria lobificans* Nyl., [Washburn 1007, etc.]
*Myelochroa aurulenta* (Tuck.) Elix & Hale, [Washburn 1021, etc.]
*Parmotrema hypotropum* (Nyl.) Hale, [Washburn 1020, etc.]
*Parmotrema stuppeum* (Taylor) Hale, [Washburn 1018, etc.]
*Phæophyscia rubropulchra* (Degel.) Essl., [Washburn 1033, etc.]
*Physcia millegrana* Degel., [Washburn 1008]
*Physcia stellaris* (L.) Nyl., [Washburn 1006, etc.]
*Punctelia bolliana* (Müll. Arg.) Krog, [Washburn 1043]
*Punctelia rudecta* (Ach.) Krog
*Punctelia subrudecta* (Nyl.) Krog / *P. perreticulata* (Räsänen) G. Wilh. & Ladd, [Washburn 1025]
*Pyxine subcinerea* Stirton, [Washburn 1022, etc.]

**Spring Grove Cemetery and Arboretum**
Cincinnati, Hamilton County, Ohio
39° 10.7058' N, 84° 31.8495' W, 187 m (613 feet) AMSL
Cincinnati West USGS Topographic 7.5' Quadrangle
Spring Grove Cemetery and Arboretum is a privately–owned 296.6 ha (733 acre) parcel of land located in a urban/suburban setting, approximately 7.2 km (4.4 miles) north of the metropolitan center. The trees observed here were scattered throughout the north end of the facility.

*Arthonia cæsia* (Flotow) Körber, [Washburn 1138]
*Candelaria concolor* (Dickson) B. Stein
*Canoparmelia crozalsiana* (de Lesd. *ex* Harm.) Elix & Hale
*Flavoparmelia caperata* (L.) Hale
*Lecanora strobilina* (Sprengel) Kieffer, [Washburn 1140] †
*Myelochroa aurulenta* (Tuck.) Elix & Hale
*Parmotrema hypotropum* (Nyl.) Hale
*Phæophyscia pusilloides* (Zahlbr.) Essl.
*Phæophyscia rubropulchra* (Degel.) Essl., [Washburn 1131]
*Physcia americana* G. Merr., [Washburn 1136]
*Physcia millegrana* Degel., [Washburn 1130]
*Physcia stellaris* (L.) Nyl., [Washburn 1132, etc.]
*Punctelia rudecta* (Ach.) Krog
*Pyxine sorediata* (Ach.) Mont.
*Pyxine subcinerea* Stirton
*Xanthoria fulva* (Hoffm.) Poelt & Petutschnig

**Woodside Cemetery & Arboretum**
Middletown, Butler County, Ohio
39° 29.7727' N, 84° 24.325' W, 198 m (650 feet) AMSL
Trenton USGS Topographic 7.5' Quadrangle
Woodside Cemetery and Arboretum is a privately–owned 54.6 ha (135 acre) parcel of land located in an urban setting, approximately 48.8 km (30.3 miles) north of the metropolitan center. The trees observed here were scattered throughout the south end of the facility.

*Candelaria concolor* (Dickson) B. Stein
*Flavoparmelia caperata* (L.) Hale
*Myelochroa aurulenta* (Tuck.) Elix & Hale
*Parmotrema hypotropum* (Nyl.) Hale
*Phæophyscia pusilloides* (Zahlbr.) Essl., [Washburn 1169]
*Phæophyscia rubropulchra* (Degel.) Essl.
*Physcia millegrana* Degel.
*Physcia stellaris* (L.) Nyl.
*Pyxine subcinerea* Stirton

**New County Records** -- New county records for southwestern Ohio and northern Kentucky are summarized as follows:
KENTUCKY – 4 new county records, all in Boone Co.

OHIO – 19 new county records
Butler – 3
Clermont – 5
Hamilton – 9
Warren – 2

**Discussion --** *Physcia millegrana* and *Candelaria concolor* dominate in this mostly urban environment. They are found at all sites, ranging from the not–quite–pristine to the decidedly pauperate, and are nearly the only lichens found in these latter sites. Other lichens found to be very common in this study were *Canoparmelia crozalsiana*, *Flavoparmelia caperata*, *Myelochroa aurulenta*, *Phæophyscia pusilloides*, *Phæophyscia rubropulchra*, *Physcia stellaris*, *Punctelia rudecta*, and *Pyxine subcinerea*.

Also of particular interest from the present study was the finding of *Parmotrema austrosinense*. Showman & Flenniken (2004) indicate this lichen to be rare in Ohio, while this author found it in more than one location.

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## References

Aptroot, André. 2003. “A New Perspective on the Sorediate Punctelia (Parmeliaceae) Species of North America.” *The Bryologist* 106(2): 317-319.

Brodo, Irwin M., Sylvia Duran Sharnoff, and Stephen Sharnoff. 2001. *Lichens of North America.* Yale University Press. New Haven, Connecticut.

Culberson, William L. 1951. *Some Lichens from Eastern Kentucky.* Lloydia 14(3): 181-186.

Esslinger, T. L. 1997. "A cumulative checklist for the lichen–forming, lichenicolous and allied fungi of the continental United States and Canada" North Dakota State University: http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.htm (First Posted 1 December 1997, Most Recent Update 14 June 2005), Fargo, North Dakota.

Fink, Bruce. 1935. *The Lichen Flora of the United States.* The Blackstone Company. Philadelphia, Pennsylvania.

Flenniken, Don G. 1999. *The Macrolichens in West Virginia.* Carlisle Printing. Sugar Creek, Ohio.

Fulford, Margaret. 1938. *The Cladoniae of Eastern Kentucky.* Lloydia 1(3):161-167.

Prescott, Lionel Howell. 1951. *Preliminary Studies of the Lichens of Kentucky, I.* Master's Thesis. University of Kentucky, Lexington.

Showman, Ray E., and Don G. Flenniken. 2004. *The Macrolichens of Ohio.* Bulletin of the Ohio Biological Survey, New Series, Volume 14, Number 3. Ohio Biological Survey. Columbus, Ohio.

Simpson, Martha Jane. 1978. The Epiphytic Lichen Flora of the Bluegrass Region of Kentucky and Its Relation to Air Pollution. Master's Thesis. University of Kentucky, Lexington.

Taylor, Conan J. 1967. *The lichens of Ohio, part I. Foliose lichens.* Biological Notes Nr. 3, The Ohio Biological Survey. Ohio State University, Columbus.

Taylor, Conan J. 1968. *The lichens of Ohio, part II. Fruticose and Cladoniform lichens.* Biological Notes Nr. 4, The Ohio Biological Survey. Ohio State University, Columbus.

# Seeking Funding Opportunities for Bryophyte and Lichen Inventories

James R. Shevock[1], National Park Service Research Coordinator

One of the difficult things in finding and securing funding sources to conduct bryophyte and lichen inventory work is understanding how state and federal agencies handle their appropriations. The first lesson is to realize that most agencies only get a 1 year budget, so it becomes difficult to plan for multiple year projects. Agencies generally accomplish multi-year projects through the awarding of **grants**, **contracts**, or **cooperative agreements**. Each agency also has its own set of regulations and legal authorities as prescribed by law. So for example, the National Park Service has some authorities that the Forest Service does not and vice-versa.

Most agencies are driven by a need for information that addresses a management issue. Put another way, funding goes to activities that are either causing management concern (economic, political, social, biological, etc.) or studies needed to address some level of environmental review. Generally, bryophytes and lichens are not high up on a managers list of priorities for funding. So the issue has to be viewed from a different perspective. Here is a list of 10 important things to consider in seeking state or federal funding.

1) Know the timing of the fiscal year in play for the agency you seek to engage in an inventory or other type of project. Does their fiscal year end in June or September?

2) Most agencies never have enough financial resources to do everything that they would like to accomplish. Money is generally allocated to the big ticket items first, and most agencies appear to have no flexibility or extra financial resources during at least the first half of the fiscal year.

3) Even when agencies are of the belief that they have no finances to spare to fund a bryophyte or lichen inventory, things have a way of changing during the last quarter of the fiscal year. Sometimes things just change

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(priorities) or a particular project planned earlier in the fiscal year is scaled-down, altered, or postponed thereby creating excess funds to be reprogrammed and obligated before the close of the fiscal year.

4) Find out what are the authorities to obligate money in the agency for inventory type activities. Some agencies will have authority to provide grants while other agencies will not. Some agencies have a cap on the amount that can be sole-sourced in a contract versus conducting a competitive bid process. Some agencies prefer the contracting route while others desire a more collaborative arrangement. In the federal sector a relatively new collaborative program is called the Cooperative Ecosystem Studies Units. These 17 networks based on broad bio-geographical regions across the country partner various member academic institutions with federal agencies to conduct research, technical assistance or educational opportunities. Much inventory work is currently being done through the CESUs. The great thing about CESU projects is that they are entered into non-competitively between a federal agency and a Principal Investigator (PI) and his/her graduate students. There is no ceiling on the amount of funds that can be used for a CESU project. CESU projects can be multi-year projects or can be designed in phases or modified as additional funding becomes available. If you work for an academic institution, see www.cesu.org/cesu to determine if your institution is a member of this consortium. If your institution is not a CESU member then you can not use this specific program.

5) Make a personal agency contact. Things happen based on professional relationships and shared resource interest. If you want to conduct a bryophyte or lichen inventory then meet a person within that agency that could be interested and discuss opportunities to carry out or supplement such work. Realize that funding may materialize toward the end of the fiscal year so have a project 'on the shelf' ready to go in the event a funding stream becomes available. It becomes very difficult for agency personnel to develop meaningful projects only after the money is secured in the closing days of the fiscal year. The end of the fiscal year is also a stressful time for agency employees who have budgetary responsibilities, so projects all ready to go will move to the front of the line. Having a proposed project already worked out in advance will increase the likelihood of it getting funded. Also, many agencies have procedures and deadlines for entering into various types of financial activities near the end of the fiscal year. Be

aware of the differences between grants, contracts, and cooperative agreements and the deadlines to use them.

6) If you secure funding for a project, do everything possible to meet the mutually agreed to schedule and any deliverables. Communicate by email or phone frequently with mini-progress reports. Most agencies are going to want some type of annual report outlining the status of the project and the accomplishments to date; attention to this expectation is critical, especially if you expect to be competitive for future funding opportunities.

7) Probably the most difficult component of conducting bryophyte or lichen inventories is to accurately predict the time it will take to identify the samples collected. Nearly all field collectors I have met (me included) have a set of backlog collections awaiting determination!! Give yourself plenty of time for this component of the project. Your best strategy is to provide documentation and deliverables as you go versus waiting to deliver everything at the end of the project. Agencies are less likely to want to use your skills in the future if you have over-committed on what you can deliver on schedule.

8) The disposition of specimens can also be a rather complicated affair, at least with some agencies. Have this worked out in advance and in writing so there is no misunderstanding. For example, some agencies will just want a list of taxa with GPS coordinates for the collections and have a selected herbarium they wish the complete set of the collections to be housed so it will be available to other researchers and to the agency. Other agencies will only want a single labeled archival quality herbarium packet to represent each taxon obtained within the study area, while other agencies may want a duplicate of everything collected. Generally most agencies lack curatorial expertise and/or cabinet space to keep large collections. Nevertheless, have this topic resolved before starting the project, especially how the specimens are to be curated and labeled.

9) Depending on the size of the area to be inventoried, you may want to design the project in phases. This way you can learn as you go, build additional support for the inventory within the agency, and mutually fine-tune the project design and deliverables.

10) Projects work best when both parties benefit from the association. Select places where you can invest quality inventory efforts. Provide data in

a format that will help the agency identify cryptogamic "hot spots" for conservation on the landscape. Have a face-to-face close out at the end of the project and offer to provide a very short briefing of your findings to the land manager where the inventory was conducted. If you do a great job the word will spread automatically within the agency when another office is considering an inventory project.

## Announcement Board:

- At the direction of the ABLS Executive Committee we are implementing a two stage upgrade to Evansia. With volume 23 we are upgrading paper quality with a switch to a two column format. We are also instituting an author-solicited peer-review system.
- Effective with issue 22 (1) the senior author of each manuscript published in Evansia receives an electronic copy of their paper as a pdf file.
- Please remember that at least one author on each manuscript must have a current subscription to Evansia.

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